MINUTES OF THE MEETING OF THE NORTH CENTRAL CORN BREEDING RESEARCH COMMITTEE

1959

Reported by
G. F. Sprague, Secretary

Crops Research Division
Plant Industry Station
Beltsville, Md.
CR-23-59, April, 1959

TABLE OF CONTENTS

NORTH CENTRAL CORN BREEDING RESEARCH COMMITTEE

Minutes of the meeting held in the Illini Room of the LaSalle Hotel, Chicago, Illinois, March 4-5, 1959.

MORNING SESSION, MARCH 4

The meeting was called to order by Chairman Lowell H. Penny at 9:00 a. m. The first order of business was the appointment of a nominating committee consisting of E. C. Rossman, Wm. Wiidakas and M. S. Zuber. Following introductions, the Chairman called for reports of the various committees.

ROSTER OF ATTENDANCE

Canada

Gamble, Edwin E.
Geisbrecht, John

Illinois

Beckett, J. B. (USDA)
Hooker, A. L.
Jugenheimer, R. W.
Leng, Earl L.

Indiana

Brunson, A. M. (USDA)
Crane, Paul L.
House, L. R.
Ullstrup, A. J. (USDA)

Iowa

Bojanowski, J. S.
Dicke, F. F. (USDA)
Hallauer, A. R. (USDA)
Penny, L. H. (USDA)
Russell, W. A.
Thomas, W. I.

Kansas

Findley, Wm. R., (USDA)
Scott, Gene E. (USDA)

Kentucky

Loeffel, F. A.

Maryland (Beltsville)

Sprague, G. F. (USDA)

Michigan

Rossman, E. C.

Minnesota

Dumanovic, J.
Hayes, H. K.
Misovic, M. S.
Rinke, E. H.
Sentz, J. C.

Missouri

Grogan, C. O. (USDA)
Zuber, M. S. (USDA)

Nebraska

Lonnquist, J. H.

Ohio

Dollinger, E. J.

North Dakota

Wiidakas, Wm.

South Dakota

Shank, Boyd

Virginia

Genter, C. F.

Wisconsin

Hoppe, Paul E. (USDA)
Neal, N. P.
Strommen, A. M.

REPORT OF THE SUB-COMMITTEE ON PRESERVATION OF GERM PLASM

No report submitted

REPORT OF THE SUB-COMMITTEE ON GROUPING OF INBRED LINES FOR BREEDING PURPOSES

No report submitted

REPORT OF THE SUB-COMMITTEE ON CYTOPLASMIC MALE STERILITY AND RESTORERS

On February 11, 1959, this sub-committee submitted a questionnaire to the corn breeders of the North Central Region in order to gather information on the following subjects:

1. The extent of duplication of effort, in regard to male sterility and fertility restoration work, among experiment station workers and between experiment station workers and commercial breeders.

2. The present policy on release of sterile and fertility restoring versions of previously released inbred lines.

3. The present status of station work involving male sterility and fertility restoration.

Development of male sterile and fertility restoring lines

In general, the replies indicate that most of the stations have assumed responsibility for developing male sterile and fertility restoring versions of their own inbreds and when necessary, of inbreds from other stations. Most of the corn breeders considered this method satisfactory, although about half expressed the belief that there has been considerable duplication of effort.

At the time an inbred is released, sterile versions are usually either under development or have not yet been started.

It is the usual practice to release both fertility restoring and male sterile versions of inbreds in the same manner as ordinary lines.

In Part II of the questionnaire, each station breeder was asked to list the lines for which male sterile and restorer versions were being developed. The information obtained is presented in Table 1. Using this information, it has been possible to establish the extent of duplication of effort in the N. C. Region plus a few adjacent stations outside the region.

Of the approximately 174 inbreds for which male sterile versions are being developed, 2 are being converted by 4 stations, 8 are being converted by 3 stations, and 18 are being converted by 2 stations.

155 inbreds were reported to be in the process of having fertility restoring versions developed. Of these, 3 are being converted by 5 stations, 1 is being converted by 4 stations, 11 are being converted by 3 stations, and 20 are being converted by 20 stations.

In the North Central Region, therefore, it is evident that there is remarkably little duplication in the development of either male sterile of fertility restoring versions of inbreds.

With regard to commercial breeders, little information is available on the extent to which station lines are being used in male sterile and fertility restoration programs, although there is reason to believe that a great deal of such work is being carried on. Among seed stocks organizations, the Illinois Seed Producers Association is actively engaged in developing both male sterile and fertility restoring versions of station inbreds.

General policy

Corn breeders from 9 stations indicated they believed it to be the proper job of each experiment station to develop sterile and restorer versions of its own inbreds and 6 did not. Most felt it undesirable to convert lines from other states unless absolutely necessary. Breeders from 3 stations indicated that all such sterile and restorer work should be done by seed stocks organizations and 3 indicated the work should be done by commercial breeders and by seed stocks organizations.

It is the feeling of this committee that, when the task of developing sterile and restorer versions of previously released inbred lines is completed, most stations will have little difficulty in converting new lines as they are developed.

To the question on the desirability of using NC funds to develop and maintain male sterile and fertility restoring stocks at a single station, a variety of reactions was obtained. A majority felt that, although there was some merit in the suggestion, maturity considerations and other factors would make such a plan impractical.

Seed certification

On the questionnaire, nearly all station breeders indicated approval of the certification standards of the International Crop Improvement Association, which requires that (1) a recovered fertility restoring inbred must have been backcrossed to its recurrent parent with selection for fertility restoration relative to a specific cytoplasmic sterile source for not less than five generations and (2) proof of the fertility restoring ability of the line must be supplied by the originator.

Almost unanimous approval was also expressed for the I.C.I.A. regulations which permit a fertility restoring line to be substituted for its normal counterpart in a foundation single cross provided the fertility restoring line is the same in other observable characteristics as its normal counterpart.

Table 1. Present status of the program of developing male-sterile and fertility restoring versions of inbred lines.

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
CQ6	T4		Canada (McDonald College, Quebec)	
CQ502	S7			
"	T6			
CQ566	S7 & T5			
CQ573	S7 & T5			
CQ703	S6 & T4			
Mt42	T4			
A158	T4			
WD	T5			
W9	T5 & S6			
CO106	T6			
V3	6	1	Canada (Morden, Manitoba)	
ND203	6	1		
ND255	6	1		
CM2	6	1		
CM5	6	1		
A116	6	1		
CM7	3	1		
CM17	3	1		
WD	6	1		
CM14	2	1		
CO106	6		Canada (Ottawa, Ontario)	
CO152	6			
CO170	6			
CO190	6			
CO236	6			
CO303-1-1-2	6			
CO644-1-1	6			
CO644-2-1-2	6			
WF9	10+	6	K6,K55	Illinois
WF9		5	I153	
38-11	7+	5	K6, K55	
L317	5	4	K6, K55	
K4	8+			
N6	5			
M14	6			Full to part.shed
Ky21	5			Full shed
CI.21E	6			
W23	3			
33-16	4			
Oh51A	6			

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
				Illinois cont'd.
K55	6			Full shed
K64	4			Partial shed
C103	5			
Hy2	9	7S1	R138	Orig. source of restor. K55
I153	5			Full shed
R2	4			Partial shed
K6	3			Full shed
07	4			
W32	2			
K41	3			Partial shed
Oh41				" "
Oh43	3			
K61	2			
R67	2			
R74	2			
90	2			
R101	2			Slight shed
R103	2			Slight shed
R104	2			
R105	2			
R109B	2			
R113	2			
Ky122	3			Full shed
R127	2			
R129	2			Slight shed
R138	3			Full shed
R153	2			
R154	2			
R156	2			Slight shed
R159	2			Slight shed
R163	2			Slight shed
R165	2			Partial shed
R166	2			
187-2	6			
L289	8+			
Os420	3			
R909	4			
A	2			

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Fertility restoring version Source of restoration	Remarks
				Indiana
M14Rf		Bx654	Ia153	Released
Tr Rf		Bx554	K6	"
Os420 Rf		Bx554	Ia153	"
Hy Rf		Bx654	Ia153	"
Oh28 Rf		Bx654	Ia153	"
L317 Rf		Bx554	K6	"
C103		Bx553	Ia153	
Oh45		Bx653	Ia153	
H14		Bx6	Ia153	
H19		Bx5	Ia153	
H41		Bx4	Ia153	
H42		Bx4	Ia153	
H53		Bx2	K6	
H54		Bx3	K6	
H55		Bx3	Ia153	
H56		Bx3	Ia153	
H57		Bx3	K6	
H58		Bx2	K6	
H59		Bx2	Ia153	
H60		Bx3	Ia153	
H61		Bx2	Ia153	
H62			Ia153	
CI.28A		Bx3	Ia153	
187-2		Bx4	K6	
Oh43E		Bx6	K6	
Oh07		Bx3	Ia153	
Oh07B		Bx3	Ia153	
N6		Bx3	Ia153	
B9		Bx3	Ia153	
B14		Bx4	Ia153	
K41		Bx4	K6	
K44		Bx4	K6	
K61		Bx6	K55	
K64		Bx5	K6	
W64AT		Bx4		
H49T		Bx5		
H45T		Bx3		
H46T		Bx4		
B14T		Bx4		
A1-6	Bx6	2		Indiana-Popcorn
I28	6	2		
Sg16	6	2		
Sg18	6	3		
Sg30A	5	2		

Table 1 (cont'd.)

Inbred	'Sterile version' 'No generations ' backcrossed	'Fertility restoring version' 'No generations' ' backcrossed '	Source of' restoration'	Remarks
				Indiana-Popcorn
SA24	6			
SG1533	6	2		
Sg4516	4			
KP58K	4	2		
KP39	4	2		
473-1CD	4	2		
4533	4	2		
4722-2AA	4	3		
4619-33	3	2		
4619-31	3	2		
4521	2	2		
KP58		2		
Sg67		4		
4545		3		
				Iowa
B6		6	Ky21	one gen.self.
B7		6	Tx127c	two " "
B8		6	Ky21	
B10		6	Tx127c	
B14	4	6	Tx127c	being increased
B21		5	Ky21	
B37		6	Ky21	
B38		5	Ky21	
L289		5	Ky21	
Os420		6	Ky21	one gen.self.
L317		6	Ky21	one gen. self.
B16		4	Tx127c	
Oh51A		6	Ky21	
Oh43		6	Ky21	one gen. self
Oh45		6	Ky21 & Tx127c	
M14	8 on Reids and Vg st.	6	Ky21	one gen. self.
W22		5	Ky21	
Oh28		5	Ky21	
N6		6	Ky21	
187-2		6	Ky21 & Tx127c	one gen. self
Hy		6	Ky21 & Tx127c	" & 2 gen.self.
C103		6	Tx127c	
Oh07		6	Ky21	one gen.self
Oh41		6	Tx127c	" " "
38-11		6	Tx127c	Two " "

ON NORMAL cytoplasm

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
				Iowa cont'd.
B45,B46,B47				
B43,CI.31A	2	2	Ky21	) on T
B42	3	3	Ky21	) cytoplasm
CI.31A	3			
WF9	10+			avail. from Iowa Crop Impv. Assoc.
				Kansas
Hy	5	5	K55	
H28	9	3	K55	
K41	5	6	K6	Steriles revert to partials
K44	7	3	Mp307	
K63	4	4	K6	
K64	9			Plants in 2 plots seg. for steriles in Florida
K148		6	K55	Sterile segs. revert to part.
K150		5	K6	
K155	6	6	K55	Steriles revert to partials
K4	6	3	K6	
K201	6	3	K6	
K201R	3	2	Mp307	
CI.7	6	4	K55	
				Kentucky
Ky211	5			
Ky213	4			
T8	4			
Ky36-11	6			
Ky27		4	Ky21	white
Ky49		4	"	
CI.49B		4	"	
Ky201		3	"	
33-16		5	"	
H21		4	"	
L317		5	Ky21	Yellow
Hy		4	"	
CI.21E		5	"	
38-11		4	"	
Oh.7B		4	"	
Oh41		5	"	
C103		5	"	
CI.29B		3	"	
CI.29C		2	"	
CI.38B		3	"	

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
				Kentucky (cont'd.)
CI.42A		4	Ky21	
CI.317B		2	"	
Ky126		2	"	
Ky56-368		2	"	
Ky55-537		2	"	
Ky55-549		2	"	
				Michigan
Oh51	7			
WF9	9			
W23	6			
Oh51A	9			
MS211	4			
49	6			
MS1334	5			
Oh43	6			
B8	3			
MS206		5	(Tx173DMs x Tx-127c)	
W10		5	"	
MS12		5	"	
				Minnesota
Oh5	At least 7			
W10	"			
W22	"			
W33	"			
Oh43	"			
Oh51A	"			
A73	"			
A90	"			
W103	"			
A116	"			
A204	"			
A218	"			
A264	"			
A286	"			
A295	"			
A334	"			
A495	"			
A508	"			
A556	"			
CMD5	4			
A340	4			
V3		4	A293	A293 has same
Oh5		6	"	genes as Ia153
B9A		6	"	for restoration
W22		5	"	

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
				Minnesota cont'd.
W33		4	ND52	
W59M		4	" & SD26	
Oh43		6	A293	
Oh51A		6	"	
A73		6	"	
A90		4	ND52-SD56	
W103		4	" "	
ND203		4	A293	
A427		4	ND52	
A223		5	A293	
A239		2	"	
A297		3	"	
A286		5	"	
A295		5	"	
A375		5	"	
A495		4	"	
A502		4	SD26	
A509		4	ND52-SD26	
A513		4	A293	
A556		4	"	
MS1334		4	"	
A570		3	"	
A251		3	"	
				Missouri
B41	5	4	K6	
CI.21E	3	3	A293	
CI.42A	3	3	"	
38-11	5	-	----	
CI.38B	2	2	A293	
Mo.3	4	3	"	
K4	3	-	----	
B2 (Mo.)	4	-	----	
CI.7	4	4	A293	
Oh7A	4	4	"	
Ky27	4	4	K6	
Ky49	4	-	-----	
Mo.22	4	1	K6	
H28	3	2	"	
Mo.1W	5	4	"	
K201r	5	4	R7	
T111	3	2	K6	
1518	3	3	Ky122	
1520	4	3	K55	
1560	4	3	"	

Table 1 (cont'd.)

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
				Nebraska
N6	5	5	I153-K55	
N15	4	4	I153	
				North Dakota
ND167	7	2	ND52	
ND203	7	2	ND52	
ND255	7	2	ND52	
ND283	7	2	ND52	
CMV3	7	2	ND52	
A111	7 1/	2	ND52	
W-M13	7	2	ND52	
"	7	2	Ia153	
"	7	2	ND211	
Semisterile and fertile				
ND211	7	2	Ia153	
ND230	7	2	ND52	
A90	7	2	Ia153	
"	7	2	ND52	
"	7	2	ND211	
				South Dakota
SD1	4	4	SD26	
SD5	5	5	"	
SD7	5	5	"	
SD48	5	5	I153	
Oh56A	5	5	SD26	
B8	5	5	I153	
420	4	4	SD26	
W103	3	3	I153	
A509	3	3	I153	
Oh43	3	3	SD26	
				Ohio
WF9	7+*			
Oh51	7+*			
Oh43	7+*	7	I153	needs further backcrossing
Oh51A	7+*	completed	I153)	All restorer versions in T cytoplasm
Oh05	7+*		)	
Oh28		completed	I153)	

1/ Many anthers extruded-but no pollen expelled

* Seed stock organization supplies

Table 1 (cont'd.

Inbred	Sterile version No generations backcrossed	Fertility restoring version No generations backcrossed	Source of restoration	Remarks
			Ohio cont'd.	
Oh45		completed	I153	
A375	3	3	"	
1097-57	2	2	cash	
Oh40B		3	I153	
Oh33		3	"	
Oh56A		3	"	
Oh3267		2	"	
Oh32		2	"	
Oh05		3	"	
W22		5	I153	
Oh26D		4	"	
Oh26F		5	"	
Oh45A		4	"	
Oh07		2	"	
CI.38B		3	Woodburn	
CI.42A		5	"	
Oh7b		3	"	
Oh7N		2	"	
Oh7L		2	"	
Oh7K		3	I153	
Oh41		4	Woodburn	
C103	2	2	"	
Oh3C				
Oh7A	4			
Oh4C	4			
Oh57	3			
Oh7N	3			
			Wisconsin	
WF9	8+		Texas type	
W32	7+	2-3	K6,K55,Ky21	
WR3	6+	3	K55	
W64A	4	2-3	K55,Tx127c	
WM13R	6+	2-3	W153R	
W9	6+	2-3	W153R	
W22R	5	2-3	Ky55,K55	
W37A		3	Ky55,Tx127c	
Oh43	6	3	Tx127c,K55	
C103	5	2-3	Ky21, Tx127c	
W182D	6	2-3	Ky55,K55,153R	
W182D	6	3	K55	
W187R	5	2	Ky21,Ky55,K55	
W374B	5	2-3	K55,Ky55,Ky122	
W59M	4			
WD	4			
W103	4			
W117	4			

Jack B. Beckett, Chairman
John H. Lonnquist
W. A. Russell

The report was presented by Committee Chairman, J. B. Beckett who MOVED that it be accepted.

Seconded and passed.

REPORT OF THE SUB-COMMITTEE ON MATURITY STUDIES

No formal report was presented. The Committee Chairman, N. P. Neal, indicated that some 50 hybrids were studied at 20 locations through the cooperation of Experiment Station and Hybrid Corn Industry personnel. A similar experimental approach is planned for 1959. The 1958 data have not yet been completely summarized. On the basis of data now available it appears that there is a considerable variation in number of thermal units required to bring a given hybrid to physiologic maturity (40 percent of H_2O in the grain). The number of thermal units appears to be influenced by soil fertility, soil moisture, longitude and latitude and possibly other factors. It was suggested that there may be need for the re-evaluation of the present 100-900 maturity series. Two alternatives were suggested.

Alternative No. 1. Maintain the present 100 to 900 maturity series but with inclusion of 150,250, and 350 as additional series to meet the requirements of the Northern States.

Alternative No. 2. Extend the maturity series to 1200. This possibility is the simplest method and might involve less confusion although it entails a change in the classification presently in use.

Either alternative involves the acceptance by all concerned of a type hybrid for each series. Unless a large segment of the hybrid corn industry would agree to adopt a specific system little would be gained by either alternative.

REPORT OF THE SUB-COMMITTEE ON COOPERATIVE WINTER NURSERIES

No report submitted.

REPORT OF THE SUB-COMMITTEE ON THE USE OF STATION LINES IN THE HYBRID CORN INDUSTRY

No report submitted.

R. W. Jugenheimer MOVED that this Committee be disbanded.

Seconded by J. H. Lonnquist and passed.

AFTERNOON SESSION, MARCH 4

The afternoon session was devoted to discussion of a series of topics which had been suggested to the Chairman as being of general interest. On the basis of a directive to the Executive Committee by the 1958 Corn Research Committee the first topic for discussion was "How I would breed corn." H.K. Hayes, N. P. Neal and G. F. Sprague discussed this topic from different viewpoints and abstracts or resumés are presented below.

Corn Breeding Methods, Past, Present, and Future
H. K. Hayes

A brief history was given of important steps relating to the development of controlled pollination methods of corn breeding. The phases discussed included studies of East and Shull, other studies of selection in self-pollinated lines, Jones' double-cross plan, characters of inbreds and their hybrids, the development of cooperation, tests for general combining ability, predicting double cross yields, genetic diversity, and specific combining ability. In connection with the latter subjects, unpublished data from Minnesota from 15 inbreds and their F_1 crosses were presented briefly. The inbreds were placed in three groups for performance by the average production indices of their 14 crosses. Performances of individual crosses, such as L x L, M x M, and H x H ranged widely. However, H x H, on an average or from individual crosses, had a higher performance index than L x L. It seemed probable that each of the inbreds has better than average combining ability.

Present-day methods of breeding were discussed briefly. It was suggested that reciprocal recurrent selection appeared to be desirable using synthetics from such origins as the A and B groups of Station inbreds, and that when feasible germ plasm of Mexican varieties be added to these groups. Intensive research in breeding methods seemed desirable now that good hybrids were available throughout the Corn Belt.

Corn Breeding in Wisconsin
N. P. Neal

In this presentation emphasis was laid on three problems, early maturity, stalk rot resistance and cold tolerance. None of the early lines derived from adapted open-pollinated varieties possess a desired degree of stalk rot resistance. This desired quality has been obtained through second cycle or backcross recoveries of Early x Late combinations. Wisconsin hybrids in commercial production involve 29 lines.

Of these, 14 are first cycle, 11 are second cycle, and 4 are back-cross recoveries. (Backcrossing is used for only 1 or 2 generations). It is believed that the ultimate yield potential has been nearly reached and that subsequent improvements will come from greater disease and insect resistance. Improvements in cold tolerance have been achieved through a combination of early planting and laboratory cold test evaluations.

The method of corn breeding found useful in the United States may not be the most efficient in other parts of the world.

Problems in Corn Breeding
G. F. Sprague

If one were to discuss applied corn breeding it would be necessary to specify the stage of the program, ecological conditions, etc. It appears more profitable to limit the discussion to the theoretical aspects of breeding. At present it appears there is no phase of corn breeding in which our theoretical information appears to be entirely adequate. At various times in the past it has been assumed that the ultimate development has been reached and further progress is unlikely or impossible. These ideas ignore the fact that each breeding method uses, e.g. mass selection, ear-to-row, and inbreeding and hybridization, have potential ceilings which are imposed by the efficiency of control of genetic variability and not by the existence or absence of genetic variability itself.

If further progress is to be made, additional information is needed on the following points:

1. The relative efficiency of different breeding procedure.

2. Magnitude of additive genetic variance freed of interaction variances and its relation to the magnitude of variance due to genotype-environment interaction.

3. The magnitude of epistatic variance to total genetic variance.

4. The nature of genetic differences among varieties.

5. Are rates of genetic variance to genotype-environment variance proportional for additive, dominance and epistatic effects.

6. Further development of genetic theory and experimental design which will permit estimation of desired parameters.

7. Mutation rates for quantitative traits.

Until such information is at hand we have no valid basis for speculation as to the ultimate yield levels which may be attained.

Mechanical Planting of Corn Yield Trials and Breeding Nurseries

E. C. Rossman

Spiraling labor costs and dissatifaction with the quality of hand planting corn yield trials and nurseries prompted a search for a mechanical method to reduce labor costs and improve quality of planting. Previous economy measures had forced elimination of the thinning operation.

Cherewick (Can. Jour. Agr. Res. 47:642-643, 1954) described a cone seeder for small grain plots. These units are manufactured by Craftsman Machine Company, 201 Princess Street, Winnipeg, Manitoba, Canada. Two of these seeders were purchased for $182 and adapted to replace the regular seed hoppers on a two-row Ferguson corn planter. Three breeding nurseries and 10 yield experiments were planted with this planter in 1957 with encouraging results. Two men, tractor driver and planter operator, planted a five acre nursery consisting of 2,600 one-row plots 25' long in seven hours, averaging 370 plots per hour.

To provide more uniform distribution of corn seed, to reduce rolling and bunching of seed, to improve clean out of seed, and to reduce the lag in planting starts, Charles E. Brown, Sr., technician, cast and machined revised versions of the seed cones and hoppers. In 1958, regular seed hoppers on a new four-row John Deere corn planter and the two-row Ferguson planter were replaced with these units. Seats, on which the planter operators ride, and trays for seed packets were added to both planters. A set of photographs showing details is available at cost by writing to the author.

The four-row planter requires a three man crew, tractor driver and two planter operators feeding seed packets to two rows each. The two-row planter requires two men, driver and operator.

Plot dimension for yield trials was changed from 2 x 5 hills to one row drilled 30 feet with a three foot alley at the end. Length of plot can be modified from 7 feet to 35 feet with various combinations of sprockets. For a specified length of plot, the seed cone empties the seed during one full revolution. All seed operations are in full view of the operator at all times.

As soon as the field is mapped, seed packets for each field length row are arranged and separated according to the field map. The field is cross marked with the tractor only to mark alleys as a guide for the planter operator in tripping the seed hoppers. Planting is continuous from one plot to the next across the length of the field with only an occasional stop.

In 1958, 35 acres of yield trials and 20 acres of breeding nurseries were planted near East Lansing with the four-row planter and three men. The two-row planter and tractor was transported on a $1\frac{1}{2}$ ton truck and

used to plant 12 over-state yield trial locations varying from 800 to 2,500 plots (2 to 6 acres). Two men planted a location per day including travel time.

To compare experimental errors, four methods of planting were compared in four uniformity trials planted with Michigan 300 double-cross seed as 8 x 8 triple lattice designs with three replications each. The four methods of planting were: (1) machine planted 30 seeds drilled in 30 foot plots with the four-row planter, (2) hand planted 30 seeds drilled about one foot apart, (3) hand planted 30 seeds in 10 hills three feet apart, and (4) hand planted five seeds per hill in 10 hills and thinned to three plants per hill. All plots were 30 feet long.

Planting was done by two experienced technicians emphasizing careful planting but not speed. The four-row planter and three men averaged 640 plots per hour or about 213 plots per man hour compared to 76, 128, and 108 plots per man hour for the three methods of hand planting, respectively. Average stand counts for the 192 plots of each method were 93.1%, 98.0%, 91.2%, and 98.4% respectively.

Distribution of stands for machine drilled plots was not as uniform as hand planted drilled plots or hand planted thinned plots in hills, but was slightly more uniform than hand planting three seeds per hill, the usual method of planting without thinning (Table 2).

Range in field weights was less for hand planted thinned plots than for the other three methods which were similar in range of weights (Table 3). The lower average plot weight, 19.6 pounds, for machine planted plots is believed to be due more to soil differences and slightly lower stand than to method of planting. The distribution curve of plot weights for machine planted plots was flatter indicating greater variability in plot weight.

Correlations of stand and plot weights for the four methods were .47**, .56**, .64**, and .27** respectively. The lowest correlation, .27, for hand planted thinned plots reflects more uniform stand and plot weights. Weights from machine drilled plots were less dependent on stand than weights from hand planted unthinned hilled plots and other sources of variability were greater for the machine planted plots.

Coefficients of variation were 10.2%, 8.2%, 6.4%, and 5.0% for the four methods analyzed as triple lattice designs (Table 4). Two experienced technicians hand planted these trials. With inexperienced less conscientious labor, these differences in coefficient of variation favoring hand planting could be narrowed or become even greater for hand planting.

Stands and plotweights were more uniform and the experimental error was lower for hand planted thinned plots than for machine planted plots. These results demonstrate that, for most precise comparisons, hand planted thinned plots would be preferred if careful planting is done by the available labor. With large yield trials and nurseries, it is usually necessary to call on inexperienced less conscientious labor for hand planting.

When the thinning operation was eliminated, uniformity of stands with machine planting was at least as good as hand planting in hills but variations in plot weight not associated with stand tended to be greater in these comparisons. Since all machine planting can be done by one or two experienced planter operators, coefficients of variation and stand variability could increase considerably with the usual temporary labor available.

Table 2. Distribution of stands with four methods of planting. 1958.

Plants per plot	Percentage of plots in each class: Machine drilled 1/	Hand drilled 2/	Hand hills 3/	Hand planted thinned, hills 4/
20	0.5	- -	0.5	- -
21	0.5	- -	0.5	- -
22	2.1	0.5	0.5	- -
23	2.1	0.5	2.6	- -
24	6.3	- -	3.6	0.5
25	3.1	- -	8.3	- -
26	9.4	2.6	13.0	1.0
27	9.9	4.2	16.7	1.6
28	10.4	9.4	18.8	5.7
29	14.6	14.6	22.4	24.5
30	41.1	68.2	13.0	66.6
Ave. stand %	93.1	98.0	91.2	98.4

1/ Machine planted - 30 seeds drilled, 1 row plots

2/ Hand planted - 30 seeds drilled, 1 row plots

3/ Hand planted - 30 seeds in hills, 1 x 10 hills

4/ Hand planted - 50 seeds in hills, thinned to 3 plants per hill, 1 x 10 hills.

Table 3. Distribution of field weights for four methods of planting. 1958.

Class interval pounds	Percentage of plots in each class Machine drilled 1/	Hand drilled 2/	Hand hills 3/	Hand planted thinned, hills 4/
14.1 - 15.0	2.6	0.0	1.0	0.0
15.1 - 16.0	4.2	1.6	0.5	0.0
16.1 - 17.0	3.6	0.5	1.5	0.0
17.1 - 18.0	13.0	2.1	3.6	0.5
18.1 - 19.0	14.1	6.2	8.9	3.6
19.1 - 20.0	15.1	10.1	16.1	11.5
20.1 - 21.0	16.7	19.8	27.1	20.9
21.1 - 22.0	17.7	14.1	21.4	27.6
22.1 - 23.0	7.8	17.7	15.6	20.8
23.1 - 24.0	3.6	19.3	3.1	12.0
24.1 - 25.0	1.0	4.2	1.0	2.0
25.1 - 26.0	0.5	3.6	0.0	1.0
26.1 - 27.0	0.0	0.5	0.0	0.0
Average	19.6	21.6	20.6	21.6

1/ Machine planted - 30 seeds drilled, 1 row plots

2/ Hand planted - 30 seeds drilled, 1 row plots

3/ Hand planted - 30 seeds in hills, 1 x 10 hills

4/ Hand planted - 50 seeds in hills, thinned to 3 plants per hill, 1 x 10 hills

Table 4. Analyses of variance (field weights) for four methods of planting hybrid corn yield trials. 1958.

Source of variation	D.F.	Mean squares Machine drilled 1/	Hand drilled 3/	Hand hills 3/	Hand planted thinned hills 4/
Total	191				
(Entries)	63	5.22	4.50	3.00	1.66
Reps	2	51.65**	10.92	10.29	56.48**
Error	126	4.93	4.47	3.21	1.38
Coefficient of var.%		11.3	9.8	8.7	5.4
Blocks (eliminating entries)	21	11.07**	12.78**	11.59**	3.47**
Intra-block error	105	3.70	2.81	1.53	.97
Coefficient of var.%		10.2	8.2	6.4	5.0
Gain in efficiency %		21.7	42.4	84.5	20.0

1/ Machine planted - 30 seeds drilled, 1 row plots
2/ Hand planted - 30 seeds drilled, 1 row plots
3/ Hand planted - 30 seeds in hills, 1 x 10 hills
4/ Hand planted - 50 seeds in hills, thinned to 3 plants per hill 1 x 10 hills

Mechanization of Corn Yield Trial Harvest

Paul Crane

Mechanical harvesting of corn yield trial plots was not original with us at Purdue. We got the idea from Dr. Stringfield who was using it in the 1940's.

We first chose a New Idea one-row pull-type picker. By shortening the elevator to about two-thirds its original length, we prevented its swinging when trailing it on the road. It was trailed directly behind a half-ton carry-all at speeds of 40 to 45 on good roads. A large double-throated bagger was added and a sheet metal false bottom below the elevator which carries the ears from the snapping rolls to the husking bed. This picker was quite satisfactory for the harvesting of ear corn.

In 1958 we obtained a Ford mounted one-row picker-sheller. The elevator was again shortened, a bagger added and the extra elevator buckets inserted for faster clearing. The clearance was adjusted between the auger and the bottom panel for minimum space or maximum clearing of grain. A tube was placed inside the auger tube leading from the sheller to the elevator and a shaped block in the bottom of the elevator to prevent grain from remaining at these points.

When possible we use a 5-man crew; 1 driving the tractor, 1 bagging the grain, and 3 to weigh, determine moistures, record, and dump the grain into a wagon or truck. We use a battery-operated "safe-crop" moisture tester sold by Burrows. Our average speed on an all-day basis varies from 50 seconds to 1 minute per plot. Or in other words we can harvest a 500-plot experiment in an 8-hour day.

The Interaction of Detasseling, Sterility, and Spacing on the Performance of Corn

C. O. Grogan

The response of corn to detasseling has been studied intermittently for the past 70 years. These studies have included the influence of detasseling, per se, the effect of removing leaves with the tassel, the effect of smut following detasseling, and the influence of stresses on detasseling responses. The gain or loss from detasseling in these studies varied considerably.

Since detasseling is a mechanical means of preventing the production of viable pollen and male sterility is a heritable means of doing the same, there should be some similarity in their effects of the performance of the corn plant. If this is true, it may help in explaining the reports of superiority of male sterile hybrids to their normal counterparts.

The white single cross, H21 x 33-16, and the male sterile counterpart, 33-16 Tms x H21, were used in a study to determine if the reaction of male sterile and detasseled normal corn is similar under the stress of close spacings. Three spacings between plants, 6, 12 and 18 inches, in 38-inch rows were used in this study. The male sterile and the normal were detasseled and not detasseled. The tassels were removed when they could be grasped and, in the case of the normals, before they shed pollen.

The greatest difference in any one comparison was a 42.6% increase of non-detasseled normal at the 6-inch spacing. Detasseled normal versus non-detasseled normal reacted similarly but was not of the same magnitude. There was a slight, but not significant, difference between non-detasseled and detasseled sterile. The differences within individual comparisons were greatest at the 6-inch spacing and followed by 12 and 18-inch spacings, respectively. The differences were not significant at the 18-inch spacing.

The differences in the 6 possible comparisons of the 4 hybrid-treatments may be explained on the basis of nutrient, energy, and perhaps water losses occurring in the development of pollen and the losses from the removal of the tassels. The loss from the removal of the tassels was slight compared to the loss from the development of pollen when the plants were grown under the stress of high plant densities. There was some loss from the early stages of pollen development before the tassels were removed where detasseled normal and non-detasseled normal or male sterile were compared. This would account for the superiority of detasseled male sterile to detasseled normal. Non-detasseled male sterile should not have sustained any losses.

It is believed the evidence is sufficient to indicate a similarity between the reaction of detasseled normal plants and cytoplasmic male sterile plants of the same hybrid under the stress of close spacings. It may be assumed the reactions would be similar under other stresses.

The results of this study present a practical possibility. Supposing a stress occurred in a field of corn through an above-optimum plant population, poor soil, drought, or a combination of two or more of these factors. If this field was composed of a 50-50 blend of male sterile to normal (mechanically or one restorer in the male parent) and the stress was such that the male sterile would out-yield the normal by 42% (as occurred in this study), the field would produce 21% more than if it was 100% normal.

Preliminary Results from a Study Involving Crosses of Prolific, Semi-Prolific and Non-Prolific Inbred Lines of Corn

M. S. Zuber

There has been an increased interest in Missouri for prolific hybrids of US 13 maturity during the past 10 years, especially in southern Missouri where periods of drought during July and August occur quite frequently. The recommended plant density for the area is about 10,000 plant per acre. Single-ear hybrids are therefore limited in their maximum yield in years with favorable growing seasons, and it has been demonstrated that some prolific hybrids planted at this rate under favorable growing conditions, yield as well as single-ear hybrids planted at the 16-18,000 rate. Thus, farmers can usually obtain the maximum yield from prolific hybrids planted at the 10-12,000 rate under either adverse or favorable seasons. It is assumed the prolific hybrids can better adjust their growth pattern to the type of growing season by varying the number of ears on each plant. With a single-ear hybrid, the number of ears can be changed only by increasing or decreasing the planting rate. An early prolific hybrid is desired as its flowering date is more apt to miss the hot, dry period which usually occurs in July and August. There also is interest in prolific hybrids adapted to the northern part of the state.

Several attempts have been made to transfer the prolific character to early maturing inbred lines at the Missouri station. However, it has been found to be a character that is very difficult to transfer and this may be due to a close linkage between late maturity and the prolific character. No doubt a different breeding technique is needed than the one used which was selecting for the prolific characteristic in each generation of inbreeding.

In a rate of planting study, a considerable range was found in the yield performance of 5 different prolific hybrids compared at three planting rates over a 3-year period. The type of yield performance desired in a prolific hybrid was shown by Dixie 33 where the yield was about the same at the 3 planting rates, whereas the yields of the other 4 prolific hybrids were influenced by different planting rates.

It might be well to give our definition of a true prolific, semi-prolific and non-prolific corn at this time. A true prolific is a corn where the size of the upper ear remains relatively constant under different environmental conditions and its weight never exceeds 0.5 of a pound (15.5% grain moisture). No matter how favorable the growing conditions may be, the 2nd and 3rd ears likewise will not exceed 0.5 of a pound in size. Dr. Bauman, working with prolific hybrids at Tifton, Georgia, prevented 2nd ears from forming by bagging shoots and he could not force

the first ear to exceed 0.5 of a pound. Likewise, when he prevented the 1st ear from forming, the 2nd ear only slightly exceeded the weight attained by the 2nd ear when the first ear was present. A semi-prolific corn is one, where under favorable environment, will produce a second ear but the upper can exceed 0.5 of a pound. The non-prolific corn is one that produces one ear that can exceed 0.5 of a pound and rarely a second ear developes.

To better understand the inheritance of the prolific characteristics, a study was started where all possible F_1 crosses were made between 3 prolific, 3 semi-prolific and 3 non-prolific inbreds. These inbreds were classified for the prolific character on the basis of previous progeny tests. Single cross seed was available to compare 34 of the 36 possible F_1 crosses. These were planted in a 6 replicated test consisting of single row plots of 15 plants spaced to give a plant population of 14,000 plants per acre. The upper and lower ear for each plant of each cross was harvested separately. These ears were dried uniformly to about 8% moisture and the upper and lower ear data were recorded. These data are summarized in Table 5 and include the percent of upper and lower ears, average number of ears per plant, average weight of upper and lower ears, average weight of all ears, total ear weight per plant, shelling percent of upper and lower ears, length of upper and lower ears, diameter of upper and lower ears, cob weight for upper and lower ears and diameter of cob for upper and lower ears.

From these data dominance for any of the 3 types was not detected. The results for the upper and lower ear measurements follow a linear pattern in accordance with the parentage. These results follow closely the responses received from other studies we have made involving quantitatively inherited characters.

The F_2 and 1st generation backcrosses will be studied to finish the inheritance phase of this investigation. However, we feel these F_1 data are sufficient to give us some basis for suggesting a method that we plan to use for transfering the prolific characteristic to non-prolific Corn Belt inbreds.

The method we propose is to self plants in segregating generations of prolific by non-prolific crosses, and outcross these to a prolific tester. Grow the test progenies at a plant density of about 12,000 plants per acre, space planted. These would not need to be replicated but the plot size should be sufficiently large enough to give reliable data on the following: 1. average number of ears per plant and 2. average weight of the upper ear. The selection would then be for best crosses with the highest average number of ears per plant with an average of the upper ear weight not exceeding 0.5 of a pound on an air-dry basis. During the selfing and outcrossing cycle, out-crosses to the recurrent parent could be made. Alternating generations of selfing and backcrossing could be used, but testing for the prolific character each generation would be necessary.

Table 5. Summary of Data for Upper and Lower Ears from Prolific, Semi-prolific and Non-prolific F_1 Crosses. Tested Near Huntsdale, Missouri in 1958.

Comparison	No. Ears up.	No. Ears low.	Ears per Plant	Ear Wt. Ave. up.	Ear Wt. Ave. low.	Ears Wt. Ave.	Total Ear wt. per Plant	Shelling up.	Shelling low.	Ear Length up.	Ear Length low.	Ear Diameter up.	Ear Diameter low.	Cob Weight up.	Cob Weight low.	Cob Diameter up.	Cob Diameter low.
	%		No.	lbs.		lbs.	lbs.	%		cm.		cm.		gms.		cm.	
Prolific X Prolific	51	49	2.0	0.49	0.33	0.41	0.81	85.5	85.8	19.6	15.8	4.8	4.5	32	21	2.6	2.5
Prolific X Semi-prolific	55	45	1.8	0.57	0.32	0.46	0.83	85.4	85.1	21.8	16.3	4.8	4.4	37	21	2.7	2.5
Prolific X Non-prolific	67	33	1.5	0.66	0.32	0.55	0.82	84.0	82.7	21.9	14.7	5.1	4.6	48	24	2.9	2.6
MEAN	58	42	1.8	0.57	0.32	0.47	0.82	85.0	84.5	21.1	15.6	4.9	4.5	39	22	2.7	2.5
Semi-prolific X Prolific	55	45	1.8	0.57	0.32	0.46	0.83	85.4	85.1	21.8	16.3	4.8	4.4	37	21	2.7	2.5
Semi-prolific X Semi-prolific	79	21	1.3	0.54	0.20	0.47	0.59	84.7	82.4	23.1	14.5	4.6	4.0	37	14	2.6	2.2
Semi-prolific X Non-prolific	73	27	1.4	0.69	0.25	0.56	0.79	83.2	79.2	23.7	14.8	5.0	4.2	53	18	2.9	2.5
MEAN	69	31	1.5	0.60	0.26	0.50	0.74	84.4	82.2	22.9	15.2	4.8	4.2	42	18	2.7	2.4
Non-prolific X Prolific	67	33	1.5	0.66	0.32	0.55	0.82	84.0	82.7	21.9	14.7	5.1	4.6	48	24	2.9	2.6
Non-prolific X Semi-prolific	73	27	1.4	0.69	0.25	0.56	0.79	83.2	79.2	23.7	14.8	5.0	4.2	53	18	2.9	2.5
Non-prolific X Non-prolific	90	10	1.2	0.85	0.17	0.76	0.88	80.8	78.8	23.6	12.4	5.6	4.3	75	14	3.4	2.5
MEAN	77	23	1.4	0.73	0.25	0.62	0.83	82.7	80.2	23.1	14.0	5.2	4.4	59	19	3.1	2.5
GRAND MEAN	64	36	1.5	0.64	0.28	0.53	0.80	84.0	82.3	22.3	14.9	5.0	4.4	47	19	2.8	2.5

European Corn Borer Resistance Studies

F. F. Dicke and L. H. Penny

The biology involved in relative resistance to the European Corn Borer has received a good deal of attention since a two brooded population became dominant in much of the Corn Belt. It is generally recognized that early leaf feeding resistance is effective against the newly hatched larvae of the first brood on corn in the whorl stage of growth. This resistance is characterized by small pinwhole or short elongate lesions on the leaf blade. Long and ragged lesions are characteristic of susceptibility.

During the beginning of the second brood period most dent corn has grown beyond the silking stage and the young larvae no longer begin their feeding on the leaf blade but primarily on pollen accumulations and ear shoots. However, in both broods the middle stages of the larvae (3rd and 4th) are largely sheath feeders. A susceptible leaf blade may be associated with a resistant sheath and vice versa. Leaf feeding resistance is easily recognized and evaluated but sheath resistance is likely to be obscured by the variation in the survival of the young larvae.

A satisfactory procedure for identifying and evaluating sheath resistance is under a second brood infestation initiated during active pollen shedding. This is a high survival period which is reflected finally in stalk and ear shank invasion. Table 6 summarizes second brood data obtained by this method for 40 inbred lines. The infestation index consists of the number of internodes infested from four internodes above to four internodes below the primary ear node.

In single crosses the most effective first brood resistance observed is a combination of leaf and sheath resistance. Biological studies indicate that sheath resistance is feasible for reducing second brood loss particularly in maturities adapted to the southern part of the Corn Belt and in the South.

Table 6. Infestation index in 40 inbred lines tested against a second-brood European corn borer. Ankeny, Iowa, 1958.

Inbred	Average Shank Cavities	Internodes infested Above ear	Internodes infested Below ear	Total
B14	0.3	2.2	1.8	4.1
B37	.7	2.8	2.5	5.3
B38	.7	1.4	1.1	2.9
B39	.7	2.4	2.6	5.0
B40	.5	2.3	2.7	5.3
B41	1.3	2.4	2.8	6.5
B42	.9	1.9	2.8	5.6
B43	.7	2.1	1.8	4.8
B44	.7	.9	2.0	3.3
B45	.6	1.8	3.2	5.6
B46	.8	2.5	2.6	6.2
B47	.8	2.8	2.7	6.4
B48	.5	1.2	1.6	3.2
CI.31A	.7	.9	1.5	3.4
WF9	1.6	2.6	2.0	6.1
Hy	1.0	2.5	3.1	6.4
W22	1.7	3.4	3.2	8.4
Oh43	.9	3.5	2.4	6.7
Oh41	.7	1.4	1.3	3.5
N6	.7	1.1	1.0	3.6
N22A	.7	2.2	2.4	4.9
(Minn.Syn.#1)-24-3-1-2	1.1	2.6	2.7	5.7
(A392 x R61)-1-17-1-1-2	.4	2.5	2.1	5.1
(A392 x R61)-1-23-3-2	.5	2.1	2.6	5.5
(Oh45 x W92)-1-1-2-1	.8	2.0	2.0	5.1
(Corn Borer Syn.)-A178-1-1-1	.7	1.0	1.7	3.7
[(M14 x A206) x Oh4C]-26-5-2-2	1.2	1.8	1.4	4.6
" -43-6-4-1	.5	1.5	2.0	4.0
(A277 x 41:2504B)-1-27-1	.3	.7	.5	2.2
Midland-125-2-1-1	.6	1.2	1.7	3.0
" 125-3-2-1	.3	1.3	2.0	4.1
MR-164-1-1-2-1	.3	.2	.4	.8
(Minn.Syn.2)-5-1-1-1	.6	1.7	1.3	3.6
(Corn Borer Syn.)-A32-1-2	.8	2.0	1.6	4.1
P-33-2-2	.8	1.7	2.2	4.7
(W24 x B2)-2-1-2-1	.7	1.5	1.8	3.7
R71	1.0	3.3	2.7	6.4
R101	.7	1.0	1.1	3.1
38-11	.5	.8	1.1	2.9
B2	.4	.5	1.0	2.3
Mean	.7	1.8	1.9	4.5

LSD P .05 = 1.3 (total)

Summary of Current Work on Dwarf Corn Hybrids

Earl R. Leng

Several agricultural experiment stations and a number of commercial seed companies now have in progress active studies with dwarf types of corn. Most of the interest is centered on "brachytic" types of dwarfing, but some studies with "compact", "reduced", and similar forms also are in progress.

In 1958, extensive field testing was conducted with three brachytic-2 composites produced by the Illinois Station, and a brachytic-2 version of Pa.602, produced by Eastern States Farmers Exchange. In general, the results could be considered inconclusive, although the br_2 E.S.602 apparently did very well in a number of locations in the Eastern United States.

Hand-harvested, replicated tests of a group of "Illidwarf" br_2 hybrids, the br_2 E.S. 602, and 5 comparable normal hybrids were conducted at 25 locations in Illinois, Indiana, and Kansas in 1958. Not all results have been computed; on the average, however, it appears that the dwarfs averaged 12 to 15 percent below the normals in yield. The expected superior standability of the dwarfs was noted at locations where lodging in normals was significant. At several locations, the dwarfs appeared exceptionally susceptible to leaf blight.

Row-spacing and plant population studies at the Illinois Station in 1957 and 1958 have indicated a slight but consistent yield advantage for the 30-inch row, 20,000 plants per acre combination. Populations in the 20,000-24,000 range have not produced excessive barrenness in the dwarfs, and standability has remained exceptionally high, even at the highest populations tested.

Harvestability studies thus far have revealed considerable difficulty with ear losses, resulting from too low ear placement. Certain types of "whole plant" harvesting equipment have given promising results, with relatively low ear and shelled grain losses.

Several commercial seed firms now have dwarf hybrids sufficiently far along to be entered in commercial performance tests. Eastern States Farmers Exchange is distributing considerable quantities of their br_2 E.S. 602 in 1959. The Illinois Station and Illinois Seed Producers Association cooperated in the production of about 40 acres of br_2 double cross seed in 1958, including a considerable proportion of Illidwarf 513 (br_2 U.S.13). Seed yields were low, because of blight infestation and the use of an F_2 seed parent.

One dwarf line, R909 (WF9 B.C.3) has been released, in both male-sterile and male-fertile versions, by the Illinois Station. Limited quantities of foundation seed for Illidwarf 513 also were offered for sale for 1959 seed production.

Table 7. 1958 Illinois Dwarf-normal Corn Tests. Summary 8 Experiments: Ashkum, Bluffs, Bowen, Galesburg, Stanford, Urbana (2 tests) and Wolf Lake.

Hybrid	Yield	Moisture	Erect	Dropped ears	Ear Height	Plant height
	bu/a	pct.	pct.	pct.	in.	in.
Normal hybrids						
U.S. 13	102.6	21.7	92	7	46	93
Pa. 602	90.0	19.8	94	2	39	85
Ill.972A-1	99.4	21.0	96	3	44	93
AES 805	99.0	22.1	96	4	39	86
Ill. 1332	99.4	20.5	95	2	46	91
Average, normals	98.3	21.0	95	4	42	90
Dwarf hybrids						
Illidwf. 513	86.1	20.1	98	1	21	58
E.S. Dwf. 602	81.5	21.2	98	0	18	54
Illidwf. 501	88.0	23.0	97	0	18	58
Illidwf. 502	84.0	22.7	96	0	19	57
Illidwf. 503	82.3	21.9	99	1	17	56
Average, dwarfs	84.2	21.8	98	1	19	57

Table 8. Comparisons of swarf and normal corn hybrids, 1958.

	Dwarf			Normal		
	Illidwf. 513	Illidwf. 506	Dwarf Composite	U.S.13	Ill. 570	Other
	Yield, bushels per acre					
Madison, Wisc.	---	---	104	---	---	104
Pittstown, N.J.	---	---	110	---	---	119
Shenandoah, Ia.	82	---	---	---	94	---
McCook, Nebr.	---	---	121	---	---	128
Danbury, Nebr.	---	----	107	---	---	110
LeMars, Ia.	---	---	70	---	---	75
Grinnell, Ia.	109	---	---	---	115	---
Georgetown, Del.	114	99	---	120	---	---
Feeding Hills, Mass.	78	88	---	---	---	80
Average	96	94 (98)	102	120	105 (105)	103
	% Erect plants at harvest					
Pittstown, N.J.	---	---	99	---	---	88
Shenandoah, Ia.	96	---	---	---	92	---
LeMars, Ia.	---	---	99	---	---	87
Grinnell, Ia.	91	---	---	---	55	---
Georgetown, Del.	84	77	---	48	---	---
Feeding Hills, Mass.	100	100	----	---	---	99
Average	93	89 (93)	99	48	74 (78)	91

Table 9. Plant populations and row spacings, dwarf corn. (Two-year summary, 1957-1958, Urbana, Illinois)

Row spacings	Yields, bushels per acre, #2 corn		
	Plant populations, per acre		
in.	12,000	16,000	20,000
40	105	124	122
30	111	118	135
20	111	119	127

(Experiments conducted and data furnished by Dr. J.W . Pendleton)

Table 10. Row spacing and plant population study, 1958. (Illidwarf 513-3 locations). Yields - bushels per acre, #2 corn equivalent.

Row spacing	Plant population							Average
	8,000	12,000	16,000	20,000	24,000	28,000	32,000	
in.				DeKalb, Illinois				
40	---	100	108	94	90	76	89	92
30	---	105	100	118	104	104	91	103
20	---	103	99	111	97	95	67	95
Average	---	102	102	107	97	91	82	----
				Urbana, Illinois				
40	---	106	123	123	117	116	114	116
30	---	115	121	135	130	112	114	121
20	---	115	122	125	129	113	116	120
Average	---	112	122	127	125	113	114	---
				Brownstown, Illinois				
40	89	113	129	134	137	---	---	120
30	90	115	126	139	144	---	---	122
20	78	113	127	141	138	---	---	119
Average	85	113	127	138	139	---	---	---
Over-all ave.	85	109	117	124	120	102	98	---

Experiments conducted and data furnished by Dr. J. W. Pendleton, Department of Agronomy, University of Illinois.

Table 11. Standability of swarf and normal corn hybrids at different plant populations. (Urbana, Illinois, 1958)

Number plants per acre	Percent erect plants at harvest (Dec.2, 1958)			
	Illidwarf 501	Illidwarf 504	Illidwarf 513	Normal U.S. 13
8,000	96	99	97	85
12,000	96	92	93	66
16,000	95	94	93	65
20,000	98	97	89	55
28,000	92	97	89	31

Pedigrees

Illidwarf 501 (R909 x R902)(R906 x R917)
Illidwarf 504 (R909 x R902)(R938 x R901)
Illidwarf 513 (R909 x R938)(R902 x R917) = Dwarf U.S. 13
U. S. 13 (WF9 x 38-11)(Hy2 x L317)

Performance, Uniformity and Practicability of Various Types of Corn Hybrids

R. W. Jugenheimer

Single, Three-way, Single-backcross, Backcross, and Double Cross Hybrids

The balanced nature of this experiment permitted studying the relative performance and uniformity of four widely-used inbred lines, and six types of hybrids involving these inbreds. An open-pollinated variety was included as a standard. The four inbred lines, Hy, L317, WF9, and 38-11, were combined in all possible combinations to produce six single crosses, twelve three-way crosses, twelve single-backcrosses, twelve backcrosses, three double crosses, and six top-crosses (Table 12).

Table 12. Kinds of hybrids depend upon the number and arrangement of the parental inbred lines.

Type of material	Pedigree
Inbred line	A
Single cross	A x B
Three-way cross	(A b X) x (C)
Single-backcross	[A x B] x [(C x D) x C]
Backcross	[(A x B) x A] x [(C x D) x C]
Double cross	(A x B) x (C x D)
Top Cross	(A x B) x Open-pollinated variety
Open-pollinated variety	Krug Yellow Dent

The theoretically homozygous inbred lines were more variable than the hybrids in ear weight, ear length, and ear height, which are traits greatly influenced by the environment. The inbred lines were very uniform in number of kernel rows which trait is determined primarily by genetic factors and affected very little by the environment.

Highest yields and greatest uniformity were obtained from the single cross, three-way cross, single-backcross, and backcross hybrids. Single cross and backcross hybrids were slightly higher yielding and more uniform than other types of hybrids. The relatively high cost of producing seed of single crosses limits their use to situations where extreme uniformity is important.

Double crosses (the most widely-grown type of hybrid) and top crosses were considerably lower yielding and more variable in plant and ear traits than the other types of hybrids. Eight of the twelve single-backcross hybrids yielded more grain than the best double cross. The best single-backcross hybrid yielded nine bushels (nearly 10 percent) more than the best double cross hybrid. It also was more uniform in plant and ear characteristics.

Seedsmen are interested in hybrids with greater uniformity and performance than presently-used double cross hybrids. Single-backcross hybrids appear to offer commercial utilization. They produce higher grain yields, contribute greater uniformity of plant and ear, and are practical to produce, inasmuch as the seed is grown on a vigorous single-cross parent.

Sister-line hybrids

Sister-line crosses are combinations between sister strains of the same inbred line. Some sister-line crosses have considerably greater yield, vigor, and standability than the original inbred line, and may be practical for the commercial use of single-cross hybrids. Data on a group of inbred lines and sister-like crosses are reported in Illinois Agricultural Experiment Station Bulletin 636.

Some growers are interested in producing Hy x Oh7 because of its ability to yield well under high plant populations. Hy2 yielded 35 bushels an acre; whereas a related sister-line cross R158 x CI.42A yielded 125 bushels per acre. This latter hybrid might be used as a seed parent. In addition it is resistant to leaf blight and is higher in protein content. Oh7 yielded 51 bushels an acre whereas, Oh7 x Oh7A, a sister-line cross, yielded 85 bushels an acre. This cross might be used as the pollen parent for the commercial production of a modified version of Hy x Oh7. Many of the other sister-line crosses appear to be promising and could be used as seed parents of single crosses.

Earl R. Leng and Wm. R. Findley, Jr., were elected as new members of the Executive Committee.

It was MOVED by W. A. Russell and seconded by N. P. Neal that the testing of double crosses on a regional basis for AES designations be discontinued. Discussion was postponed to the following morning session and the meeting adjourned.

MEETING OF THE EXECUTIVE COMMITTEE

The Executive Committee met immediately following the adjournment of the Corn Breeding Research Committee. Dr. A. J. Ullstrup was elected Chairman for the 1960 meetings.

MORNING SESSION, MARCH 5

After considerable discussion of the advantages and limitations of regional testing the vote, by States, was requested. Three states voted for and 7 against the motion which therefore failed. The next order of business was the presentation and consideration of reports for the various maturity series.

REPORT OF THE SUB-COMMITTEE ON THE 900 MATURITY SERIES

The summarized results for the 1958 tests are presented in Table 13 and the 1957 and 1958 summaries in Table 14. The data for the White three-way crosses tested in 1958 are presented in Table 15.

Yellow and white three-way crosses were produced in 1958 for 1959 uniform tests. The yellow combinations involving B41 x Oh7A as tester parent were produced by the Missouri and Virginia Agricultural Experiment Stations. White three-way crosses involving K55 x CI.64 were made by the Kansas and Kentucky Agricultural Experiment Stations. The following crosses are available for 1959 uniform tests.

B41 x Oh7A	K55 x CI.64
38-11	33-16
Oh41	H30
CI.21E	Ky27
CI.38B	Ky49
CI.21E x CI.42A	CI.49B
R132	K735
R134	K776
R197	K789
R198	K790
K7-25	K791
K7-47	K7-526
K7-50	K7-540
Mo.5	K7-649
Mo.6 (Mo.9108	Ky57-235
Mo.7 (Mo.999	Mo2RF
Mo.0225	Mo.2RH
Mo.2788A	Mo.2X4
Mo.9294	Mo.11903W
Mo.11077	Ok.1031
Mo.61072	Ok.1032
Ok.2011	Ok.1033
Ok.2012	
Ok.2013	
Ok.4001	
Ok.4002	
Ok.4003	
Ok.7001	
Ok.7002	
Va.12C	
Va.23	
Va.27	
Va.29	
Va.35C	
CI.31A	

Three-way crosses involving WF9 x T8 as tester parent for the yellow lines and Ky211 x 33-16 for the white lines will be made in 1959 for testing in 1960. Missouri and Virginia will make seed of the yellow combinations and Kansas and Kentucky seed of the white three-way crosses. Cooperators entering lines in the respective tests should supply seed as follows:

Yellow lines		White lines	
Missouri	50 seeds	Kansas	50 seeds
Virginia	50 seeds	Kentucky	50 seeds

Lines nominated for three-way crosses are listed below under the corresponding tester parent:

WF9 x T8

Line	Origin
R115	238-1A
R204	R76 x I159 (3)
R205	R76 x 38-11 (2)
R206	R76 x Kys (2)
R207	C103 x Hy2 (2B)
K8031	(K55 x K201) K55 2/
Ky108	Kansas Sunflower
Ky120	Midland Y. D.
Ky57-571	L32-3
Ky57-573	90033-3-1-1-2-1
Ky57-593	Ky201 x Ky112 1/
Ky57-610	C103 x Ky36-11
Ky57-683	M14 x K44-39-3
Mo.61012	Mo22 x B10 2/
Mo.2788B	T13 x CI.21E
Mo.3948	K64 x K4
Mo.9294	940 x Kys
Mo.53682	Kys x Ky36-11
Mo.11153	G80 x W22
Oh13	K201C x Oh04
Va.21	
Va.22	

Standards

Oh41
CI.21E
CI.38B
CI.21E x CI.42A

Ky211 x 33-16

Line	Origin
K6555	K41 x Ky39
K6558	K41 x Ky39
K6656	(K64 x 38-11) K64
K7654	(K63 x WF9)K63
K7665	(K64 x 38-11) K64
Ky215	K64 x Mo.22
Ky57-169	51275-1 R12 x Wh205
Ky57-188	4693-1-1-1 PS10 x K41
Ky57-192	47963-2-1-1 Cass Co. Wh.
Ky57-201	91111-2 (N6 x K55)
A-13	Arens
F163	(A14 x K44) K44
Ky57-242	M14 x Ky44-39
Ky57-245	M14 x Ky45-60
Ky57-252	M14 x Ky45-66
Ky57-253	M14 x Ky45-66
Ky57-256	M14 x Ky45-66
Ky57-260	M14 x Ky44-39-3
Ky57-264	JE1 x K64
Ky57-281	JE2 x K55
Mo.11496W	T13 x A73 2/
Mo.1913W	Miss.Hyd. x Ky27
Mo.11768W	H25 x H28
Mo.11496W	T13 x A73 2/
Mo.32583W	Tx401 x W24

The 900 maturity series groups of the North Central Corn Breeding Research Committee and the Southern Corn Improvement Conference expressed an interest in combining regional double cross tests. The following hybrids were nominated for the uniform regional double-cross trials.

Ill.3129 (R101 x Mo.8)(38-11 x K201)
Ill.3355 (R71 x R109B)(H49 x H51)
Ill.3360 (R101 x Oh41)(H49 x H51)
Ill. 3362 (H49 x H51)(Oh x CI.42A)
K2446 (K55 x 33-16)(K41 x H30)
K2561 (K55 x Mo.1W)(H28 x H30)
K4003 (K201R x K711)(K712 x Oh7B) Retest
Ky5708 (CI.29C x CI.38B)(C103 x CI.21E)
Ky5712W (CI.64 x 33-16)(K55 x Ky201)
Mo.881 (Oh7B x Oh29)(Mo.7 x CI.21E)
Mo.916 (Oh7B x Oh29)(Mo.6 x CI.21E)
Mo.996 (Mo.9689 x Mo.0225)(T204 x CI.21)

GA7005 (GE54 x C103)(T204 x GE62)
NC5033 (CI.21E x AS13B)(BD x AS21A)
T5005 (T474 x T490)(T218 x T220)
T7015 (T474 x T490)(A441-5 x Ky36-11)
T7018 (T474 x T490)(ITE701. x Ky36-11)
Tenn.501 (T115 x T111)(K41 x K44)
VPI 648 (WF9 x T8)(Hy3 x C103)
VPI 653 (WF9 x T8)(Oh43 x K155)

Standards

U.S. 523W	(K55 x K64)(Ky27 x Ky49)
Ky105	(T8 x CI.21E)(38-11 x Oh7B)

States entering hybrids in the 900 series tests should supply seed as follows:

Illinois	400	seeds	Virginia	360	seeds
Kansas	"	"	Arkansas	400	"
Kentucky	"	"	Georgia..(Athens)	240	"
Missouri	2-400	"	North Carolina	252	"
Nebraska	200	"	Tennessee	320	"
Oklahoma	400	"	Iowa (corn borer)	75	"

W.R.Findley, Chairman
F. A. Loeffel
M. S. Zuber

Table 13. Summarized performance of uniform 900 maturity series AES hybrid candidates--1958.

	Acre Yield	Moisture	Stand	Lodging Root	Lodging Stalk	Dropped Ears	Ear Height	Corn Borer (1-9)	Shelling	H. tur. (1-5)	Smut	Quality (5-1)
	1/	1/	2/	3/	4/	5/	6/	7/	8/	9/	8/	10/
	Bu.	Pct.	Pct.	Pct.	Pct.	Pct.	Grade	Rating	Pct.	Score	Pct.	Score
Ill.1851	108.1	19.8	97	1	5	0.9	4.0	7.0	85	3.3	3	3.5
Ill.1913	97.5	17.2	96	1	10	1.1	3.7	7.3	90	2.5	2	3.5
Ill.1918	92.2	18.6	98	1	8	0.9	3.6	7.3	85	1.8	1	2.5
Ill.3136	99.6	19.0	96	2	7	0.5	3.6	6.0	83	2.3	2	4.0
Ind.6615	107.3	20.4	95	3	4	3.1	3.8	6.7	82	1.5	5	3.5
Ind.6874	111.1	19.7	97	3	6	4.1	3.9	7.3	84	1.5	4	4.0
K2606	97.3	20.2	95	3	5	0.2	3.7	7.7	80	2.0	0	3.5
K4003	110.7	22.3	96	3	5	0.0	4.1	6.7	88	3.0	3	4.0
Ky5708	107.6	20.9	98	2	4	2.2	3.9	6.0	81	1.5	5	3.5
Ky5712	109.6	21.0	98	2	3	0.4	3.6	6.7	82	2.8	6	3.5
Ky2105	106.5	18.4	97	2	4	0.9	3.6	7.0	85	2.5	7	3.0
Mo.958	107.6	21.1	94	3	7	1.3	4.1	7.0	82	2.5	5	2.5
U.S.619W	117.7	22.4	97	3	5	1.0	3.9	8.3	83	1.5	3	3.0
Ky105	110.2	21.1	94	4	4	2.0	4.1	7.7	83	2.8	10	4.0
U.S.523W	113.3	21.7	97	4	5	0.9	3.9	7.7	84	2.5	3	4.0
Average	106.4	20.3	96	2	5	1.3	3.8	7.1	84	2.3	4	3.5
	11/	11/	11/	11/	12/	5/	6/	7/	8/	9/	8/	10/
Mo.447W	106.8	19.6	98	2	4	0.0	3.6	7.3	79	2.3	2	3.0
U.S.632	103.5	21.9	95	2	8	0.7	3.9	---	83	1.5	7	3.0
Ky105	107.7	19.8	95	4	5	2.0	4.1	7.7	83	2.8	10	4.0
U.S.523W	110.1	20.5	97	5	6	0.9	3.9	7.7	84	2.5	3	4.0
Average	107.0	20.5	96	3	6	0.9	3.9	7.6	82	2.3	6	3.5
	13/	13/	14/	13/	15/	5/	14/	7/	8/	9/	8/	10/
N7000	86.6	25.6	96	5	5	2.4	4.4	6.0	78	2.3	29	---
N7001	84.5	26.2	95	1	2	3.0	4.8	5.7	77	2.5	31	---
N7002	91.3	25.6	95	4	6	1.7	4.1	5.7	77	---	24	---
N7003	80.4	27.7	94	3	6	1.5	4.4	6.0	78	---	45	---
Ky105	104.8	21.8	93	5	5	2.0	4.0	7.7	83	2.8	10	---
U.S.523W	111.2	22.0	98	2	5	0.9	3.8	7.7	84	2.5	3	---
Average	93.1	24.8	95	3	5	1.9	4.3	6.5	80	2.5	24	---

Table 13.(Cond.)

Hybrid Pedigrees		
Candidates		
Ill.1851 (C103 X 38-11)(Oh7 X CI.21E)	1/	Brownstown and Wolf Lake Ill., Ind., Kan., Ky., Mo., Va.
Ill.1913 (R151 X R154)(WF9 X 38-11)	2/	Brownstown and Wolf Lake Ill., Kan., Ky., Mo., Va.
Ill.1918 (R151 X R153)(WF9 X 38-11)	3/	Brownstown Ill., Ind., Kan., Ky., Mo., Va.
Ill.3136 (R74 X R101)(38-11 X K201)	4/	Ind., Kan., Ky., Mo., Va.
Ind.6615 (H49 X H55)(H53 X B14)	5/	Kan., Mo.
Ind.6874 (H49 X H52)(H59 X H60)	6/	Brownstown Ill., Kan., Ky., Mo.
K2606 (K41 X K723)(K728 X K741)	7/	Iowa
K4003 (K201R X K711)(K712 X Oh7B)	8/	Brownstown Ill.
Ky5708 (CI.29C X CI.38B)(C103 X CI.21E)	9/	Kentucky
Ky5712 (CI.64 X 33-16)(K55 X Ky201)	10/	Virginia
Ky2105 (Ky209 X Ky211)(33-16 X H21)		
Mo.958 (B41 X Oh7A)(Mo.3 X CI.21E)	11/	Brownstown Ill., Kan., Ky., Mo., Va.
U.S.619W (CI.64 X K55)(Ky27 X Ky49)	12/	Kan., Ky., Mo., Va.
*Mo.447W (K41 X H28)(K55 X K6)		
U.S.632 (CI.3A X CI.27)(CI.42A X CI.21E)	13/	Brownstown Ill., Ind., Kan., Mo.
N7000 (B2895S X B49S)(K4-Ky36-11 X B489S)	14/	Brownstown Ill., Kan., Mo.
N7001 (B2895S X B278S)(B1138T X B670T)	15/	Ind., Kan., Mo.
N7003 (B2895S X B2778S)(B489S X B670T)		
Standards		
Ky105 (T8 X CI.21E)(38-11 X Oh7B)		
U.S.523W (K55 X K64)(Ky27 X Ky49)		

*Not a candidates.

Table 14. Summarized performance of AES hybrids and candidates - 900 maturity series
Average 1957 and 1958

Hybrid Designation	Acre Yield	Moisture	Stand	Lodging Root	Lodging Stalk	Dropped Ears	Ear Height	Shelling	Days to ½ silk 1/	Disease 1/	H.tur (1-5) 2/	Corn Borer (1-9) 2/
	Bu.	Pct.	Pct.	Pct.	Pct.	Pct.	Grade	Pct.		Score		Rating
Ill.1851	96.7	20.0	96	4	8	1.3	3.9	81	70	2.0	3.3	7.0
Ind.6615	94.9	21.0	93	4	5	3.0	3.5	78	68	2.0	1.5	6.7
Ind.6874	103.8	19.8	95	4	8	4.4	3.8	81	70	1.5	1.5	7.3
Mo.958	96.6	21.9	94	6	11	2.5	3.9	78	70	3.5	2.5	7.0
U.S.619W	101.8	22.4	96	6	10	1.5	3.5	81	69	1.5	1.5	8.3
U.S.523W	100.8	22.0	95	7	11	1.1	3.5	78	70	2.0	2.5	7.7
Means	99.1	21.2	95	5	9	2.3	3.7	80	70	2.1	2.1	7.3

Pedigrees

Ill.1851	(C103 X 38-11)(Oh07 X CI.21E)
Ind.6615	(H49 X H55)(H53 X B14)
Ind.6874	(H49 X H52)(H59 X H60)
Mo.958	(B41 X Oh7A)(Mo.3 X CI.21E)
U.S.619W	(CI.64 X K55)(Ky27 X Ky49)
U.S.523W	(K55 X K64)(Ky27 X Ky49)

1/ Results for 1957 only.
2/ Results for 1958 only.

Table 15. Summarized performance of uniform 900 maturity series three-way crosses--1958.

Pedigree		Acre Yield 1/	Moisture 1/	Stand 1/	Lodging Root 1/	Lodging Stalk 2/	Dropped Ears 3/	Ear Height 1/	Corn Borer (1-9) 4/	Shelling 5/	Stewarts Disease 6/	Smut 5/
		Bu.	Pct.	Pct.	Pct.	Pct.	Pct.	Grade	Rating	Pct.	Score	Pct.
(B41 X Oh7A)	X 38-11	102.4	18.5	94	2	9	1.3	4.4	7.0	88	4.0	7
"	X CI,38B	103.1	18.2	98	1	4	1.7	4.0	7.3	83	3.3	0
"	X Oh41	98.4	19.9	97	4	7	0.3	3.9	5.7	86	2.5	0
"	X CI.21E	111.0	20.5	96	0	5	1.5	4.3	7.0	84	2.5	1
"	X CI.21E X CI.42A	103.5	20.6	97	2	5	1.3	4.3	7.0	91	2.3	4
"	X R90	91.8	17.2	93	0	7	1.4	4.0	6.3	86	2.8	3
"	X R190	97.3	19.0	95	1	3	0.6	4.3	6.3	86	2.0	2
"	X R191	89.2	19.1	94	1	13	0.6	3.7	7.0	85	2.5	0
"	X K708	98.1	20.3	92	1	3	0.3	3.9	7.0	85	2.0	2
"	X K720	95.8	18.9	95	0	3	2.0	3.8	6.3	88	1.3	1
"	X K763	105.0	18.9	94	1	3	0.5	3.9	8.3	86	1.3	2
"	X K5-50	95.4	19.2	96	1	3	1.3	3.9	4.7	80	3.3	1
"	X K6-49(K766)	103.8	22.8	98	0	4	0.5	4.2	8.0	84	2.3	5
"	X Ky55-549	96.1	22.0	98	1	4	2.6	3.6	---	86	2.5	3
"	X Ky55-562	101.8	19.2	95	1	4	0.0	4.0	---	86	2.3	10
"	X Ky56-433	87.0	17.6	95	0	5	0.6	3.6	6.7	84	2.8	5
"	X Mo. Syn	95.8	17.5	98	0	9	1.3	3.9	8.0	88	3.8	1
"	X Mo.3952	81.4	19.0	73	4	9	0.8	3.6	6.7	85	2.3	5
"	X Mo.3957	104.0	18.9	96	6	7	0.0	3.9	6.7	82	2.0	0
"	X Mo.53686	91.2	19.0	92	1	9	0.0	3.9	6.3	83	2.3	4
"	X Mo.9681	89.3	17.7	96	0	4	0.8	3.6	7.0	87	2.0	12
"	X Va.6-52	105.7	18.4	100	1	6	0.3	3.9	6.3	82	2.5	3
"	X Va.6-58	98.0	18.2	95	5	1	1.1	4.0	5.7	83	2.0	1
"	X Va.6-71	106.5	18.5	96	2	3	0.6	3.8	6.3	85	2.3	1
"	X Va.6-79	101.3	20.6	92	1	1	0.3	3.9	4.3	81	2.0	1
"	X Va.6-112	103.0	18.8	94	1	2	0.9	3.2	5.3	85	2.3	1
"	X Va.6-118	100.6	20.0	98	1	2	0.0	3.7	7.0	83	2.0	0
"	X Va.6-136	92.3	20.1	96	1	3	1.6	3.5	7.0	84	1.5	3
"	X Va.6-224	110.8	19.2	96	1	8	1.3	4.1	6.3	87	2.5	0
Means		98.6	19.2	95	1	5	0.9	3.9	6.6	85	2.4	3

1/ Ill., Kan., Ky., Mo., Va.
2/ Kan., Ky., Mo., Va.
3/ Kan., Mo.
4/ Iowa
5/ Illinois
6/ Kentucky

Table 16. Summarized performance of uniform 900 maturity series white three-way crosses, 1958

Pedigree		Acre Yield Bu. 1/	Moisture Pct. 1/	Stand Pct. 1/	Lodging Root Pct. 1/	Lodging Stalk Pct. 1/	Dropped Ears Pct. 2/	Ear Height Grade 1/	Corn Borer Rating (1-9) 3/	Stewarts Disease Grade (1=Res.) 4/	Ear appearance rating 4/
(K55 X CI.64)	X 33-16	106.1	18.9	96	0	3	1.0	3.5	7.7	1.8	3.0
"	X H30	113.3	17.8	97	0	3	0.2	3.4	8.0	3.5	2.5
"	X Ky27	106.5	17.7	93	0	10	0.7	3.5	7.0	2.3	3.0
"	X CI.49B	105.9	19.5	97	1	2	0.6	3.6	7.3	2.0	2.0
"	X K730	115.6	19.4	92	0	5	0.0	3.8	6.7	3.3	3.0
"	X K755	106.8	18.3	96	0	3	0.9	2.8	8.3	3.5	2.5
"	X K784	104.8	18.9	94	0	9	0.0	3.6	6.7	2.3	3.0
"	X K5-453	110.0	19.3	94	0	2	0.0	3.3	6.3	2.5	3.5
"	X K5-474	111.7	20.1	97	0	2	0.0	3.6	7.7	1.5	3.5
"	X K5-509	106.6	22.1	94	1	0	0.0	3.3	6.0	3.0	3.0
"	X K5-512	104.0	20.1	97	0	2	0.0	3.6	8.0	2.3	1.5
"	X K5-515	108.1	21.9	97	0	2	0.0	3.4	7.3	2.3	2.5
"	X K5-516	108.1	20.7	94	0	1	0.0	3.2	6.3	2.3	2.5
"	X K5-525	115.2	20.6	92	1	2	0.0	3.9	7.7	2.8	3.0
"	X K5-557	105.5	23.0	94	1	6	0.0	3.9	7.7	2.3	3.0
"	X Ky201	104.6	17.6	99	1	0	0.0	3.0	6.7	3.0	2.5
"	X Ky209	117.6	19.0	96	0	3	0.0	3.4	7.3	2.3	2.0
"	X Ky211	104.9	17.6	90	1	1	0.6	3.4	7.7	3.0	2.5
"	X Ky213	91.9	19.7	97	1	1	0.3	3.2	8.3	2.8	3.5
"	X Ky56-126	106.2	22.0	93	1	2	0.0	3.4	6.3	3.0	2.0
"	X Ky56-150	103.9	17.8	98	0	4	0.0	3.5	6.7	1.5	3.0
"	X Ky56-180	114.4	22.2	97	1	1	0.2	3.8	7.3	2.5	2.0
"	X Ky55-190	114.3	24.2	90	0	4	0.0	3.5	7.7	3.0	1.5
"	X Mo.HP105	105.4	18.3	97	0	2	0.0	3.6	6.0	3.3	3.0
U.S.523W (K55 (Ky27 X Ky49)	X K64)	110.8	19.8	93	2	5	0.0	3.7	---	2.3	2.5
	Means	108.1	19.9	95	0	3	0.2	3.5	7.2	2.6	2.6

1/ Kansas, Kentucky and Missouri.
2/ Kansas and Missouri.
3/ Iowa.
4/ Kentucky.

REPORT OF THE SUB-COMMITTEE ON THE 700 and 800 MATURITY SERIES

The double crosses nominated for testing in this maturity group are summarized for the 1958 tests (Table 17) and for the two-year period 1957-1958 for those continued from the 1957 tests in Table 18.

Two sets of three-way crosses were produced for testing in 1958. Combinations involving (WF9 x 38-11) were produced by W. A. Russell (Iowa) and (WF9 x Hy) were produced by J. H. Lonnquist (Nebraska). The crosses were grown at Iowa, Illinois, Indiana, Ohio, Nebraska, Kansas, Kentucky and Missouri. The summarized data are presented in Table 19.

Twelve hybrids were nominated for 1959 testing.

Table 17. Uniform double cross hybrids. 800 maturity series. 1958

Hybrid	Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging: Root	Lodging: Stalk	Erect plants	Ear ht.	Smutted plants	Blight: H. turcicum	Blight: H. maydis	Dropped ears	Borer: Leaf feeding
	Bu. 1/	% 1/	No. 2/	% 3/	% 4/	% 5/	Score 6/	% 7/	score 8/	score 8/	% 9/	Score 10/
Standards												
U.S.13	97.8	18.8	76.0	0.2	19.4	72.5	3.6	1.0	2.5	1.8	2.9	7.0
AES 808	99.5	18.8	77.0	0.4	20.5	70.3	3.1	4.0	1.8	2.5	2.1	6.0
AES 809	107.2	19.6	76.0	0.7	6.5	90.2	3.0	4.0	1.0	1.3	0.7	5.7
AES 810	106.6	18.3	75.5	1.7	7.8	88.5	3.4	7.0	2.0	2.3	0.8	5.3
AES 811 W	107.4	18.6	76.5	2.9	6.0	91.9	3.3	4.0	3.3	1.3	2.1	6.0
Nominations												
Ind.6623	105.6	19.2	80.0	2.1	14.6	81.0	3.7	12.0	1.0	1.5	3.9	6.3
Ind.6833	100.4	18.9	76.0	0.4	14.4	81.2	3.7	9.0	1.5	1.5	6.2	5.3
Ill.1981	106.8	17.9	78.5	0.6	11.3	89.8	3.9	5.0	3.0	2.0	1.7	6.3
Nebr. 2248	104.6	19.3	75.0	0.8	12.4	82.8	3.3	1.0	2.3	2.3	1.6	7.0
Ia. 5023	101.2	17.4	77.0	0.3	8.0	86.6	3.4	0	2.0	3.5	2.5	5.7
Ia.5113	100.9	16.9	76.5	0.1	10.9	85.0	3.1	0	2.8	1.8	0.3	7.3
Ia.5115	110.0	18.8	77.5	0.2	5.5	92.8	3.5	1.0	2.0	2.5	1.0	6.0
Mo. 971	103.1	20.0	81.5	0.8	8.1	91.5	3.9	11.0	2.8	1.5	0.8	7.0
Ill. 1890	101.2	18.2	76.0	4.7	10.8	87.6	3.5	7.0	1.5	2.3	3.0	5.6
Ill. 1944	103.9	19.5	76.5	1.5	9.6	90.2	3.8	15.0	2.5	1.3	1.1	4.7
Ill. 3049	100.7	18.3	75.5	0.8	6.0	92.4	3.2	3.0	2.3	2.3	2.0	4.7
Ill. 3092	101.7	18.5	76.5	1.8	10.1	89.1	3.5	5.0	1.5	2.5	1.8	6.7

1/ Ia., Ill., Ind., Ohio, Nebr., Kans., Ky., Mo.
2/ Ohio
3/ Ia. Ind., Kans., Mo.
4/ Ia., Ill, Ind., Nebr., Kans., Ky., Mo.
5/ Ia., Ill., Ohio, Ky.
6/ Ia., Ill., Kans., Ky., Mo.
7/ Ill.
8/ Ky.
9/ Ia., Ill, Nebr., Kans., Mo.
10/ Iowa

Table 18. Two-year performance summary of 800 maturity double cross standards and nominations.

Hybrid	Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Smutted plants 1/	Blight 1/ H. turcicum	Blight 1/ H. maydis	Dropped ears	Borer Leaf feeding
	Bu.	Pct.	No.	Pct.	Pct.	Pct.	Score	Pct.	Score	Score	Pct.	Score
Standards:												
U. S. 13	91.2	19.2	69.9	2.7	19.7	73.6	3.6	1.0	2.5	1.8	3.6	5.8
A.E.S.808	92.1	19.4	70.0	2.9	18.6	74.0	3.1	4.0	1.8	2.5	3.4	5.8
A.E.S.809	97.3	20.2	69.5	2.6	6.4	89.7	3.0	4.0	1.0	1.3	1.4	5.8
A.E.S.810	98.8	19.2	69.8	3.2	8.0	87.8	3.2	7.0	2.0	2.3	1.4	5.3
A.E.S.811W	99.4	19.2	69.4	7.6	6.6	86.2	3.2	4.0	3.3	1.3	2.6	6.5
Nominations:												
Ind. 6623	93.6	19.6	73.2	2.6	11.8	84.4	3.6	12.0	1.0	1.5	4.4	5.2
Ind. 6833	94.2	19.2	70.4	0.6	11.8	85.6	3.6	9.0	1.5	1.5	6.0	5.6
Ill. 1981	98.9	19.0	71.7	3.3	12.0	85.6	3.6	5.0	3.0	2.0	2.4	6.4

1/ 1958 data only

Hybrid Pedigrees:

U.S.13 (WF9 x 38-11)(Hy x L317
A.E.S. 808 (")(Oh43E x H14)
A.E.S. 809 (WF9 x P8)(Oh43 x C103)
A.E.S. 810 (WF9 x H50)(Oh45 x Oh7B)
A.E.S. 811W (N72 x Mo.1W)(K41 x H30)
Ind. 6623 (WF9 x H52)(H53 x C103)
Ind. 6833 (WF9 x H52)(H54 x H60)
Ill. 1981 (WF9 x 38-11)(Oh7 x CI.21E)

Table 19. Uniform three-way crosses. 800 maturity series. 1958.

Hybrid		Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Smutted plants	Blight H. turcicum	Blight H. maydis	Dropped ears	Borer Leaf feeding
		Bu. 1/	Pct. 1/	No. 2/	Pct. 3/	Pct. 4/	Pct. 5/	Score 6/	Pct. 7/	Score 8/	Score 8/	Pct. 9/	Score 10/
(WF9 x 38-11) x	L317	102.0	18.4	74.8	0.8	14.0	79.6	4.0	6.0	2.5	2.3	2.5	5.3
do.	Hy	111.5	17.6	74.8	1.0	12.5	81.0	4.0	7.0	3.5	1.8	1.7	6.0
do.	H55	118.0	17.8	74.8	0.8	11.1	81.3	3.8	4.0	---	---	1.4	7.0
do.	H56	111.8	17.4	73.8	0.6	10.1	80.3	3.9	6.0	2.5	1.5	1.1	6.3
do.	B45	115.8	17.7	73.5	0.5	9.1	82.4	3.7	7.0	2.0	2.0	1.2	7.0
do.	K805	88.3	18.3	77.5	0.5	7.8	84.9	3.2	10.0	---	---	1.4	7.3
do.	K806	100.3	16.9	71.5	3.5	20.9	65.2	3.7	2.0	2.8	3.0	1.8	6.7
do.	Ky36-11	106.8	20.1	77.2	0.2	8.9	87.0	3.9	5.0	1.8	2.3	0.7	7.0
do.	Mo.11225	112.8	18.3	72.5	0.5	8.9	83.9	3.1	12.0	2.3	2.5	0.8	7.3
do.	Oh45s	108.5	19.5	72.0	1.7	7.5	85.3	3.2	7.0	---	---	0.0	6.0
do.	Oh7N	107.5	17.3	73.2	1.0	9.1	86.4	3.5	3.0	---	---	1.5	5.7
do.	R92	83.6	18.2	74.2	0.5	11.4	78.4	3.3	2.0	---	---	1.2	7.7
do.	R177	119.6	17.5	74.0	0.2	3.2	96.8	3.3	10.0	2.5	1.5	1.0	4.7
do.	R186	96.7	17.7	72.2	0.8	14.3	73.2	3.1	8.0	2.5	2.5	2.1	6.7
do.	R187	89.3	16.9	74.0	0.8	5.5	89.4	3.1	17.0	1.5	2.5	1.0	3.7
do.	R188	110.7	18.6	77.2	0.2	9.5	77.6	3.4	4.0	---	---	0.4	6.5
(WF9 x Hy) x	L317	108.6	19.4	74.8	1.4	14.5	79.8	4.0	2.0	2.5	2.8	3.0	5.0
do.	B45	126.4	17.4	73.0	0.8	6.1	87.8	3.5	0.0	1.8	2.3	0.9	6.0
do.	K805	113.5	17.7	72.2	0.2	9.9	85.8	3.8	10.0	2.5	2.3	0.9	7.7
do.	K806	102.1	17.2	72.0	3.7	13.1	82.7	3.6	7.0	2.5	4.0	1.8	7.0
do	Ky36-11	112.0	20.9	76.8	0.3	6.4	93.6	3.7	5.0	1.3	2.5	0.3	7.0

Table 19. (cont'd.)

Hybrid		Acre grain yield	Moisture at harvest	days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Smutted plants	Blight H. turcicum	Blight H. maydis	Dropped ears	Borer Leaf feeding
		Bu. 1/	Pct. 1/	No. 2/	Pct. 3/	Pct. 4/	Pct. 5/	Score 6/	Pct. 7/	Score 8/	Score 8/	Pct. 9/	Score 10/
(WF9 x Hy) x	Mo.11225	119.1	17.7	71.5	4.1	10.2	82.8	3.0	9.0	1.8	2.5	1.1	7.7
do.	Oh45s	122.1	20.8	72.2	2.2	3.7	94.9	3.1	1.0	1.8	2.5	0.3	4.7
do.	Oh7N	116.1	18.6	73.2	0.2	6.9	85.1	3.4	0.0	3.0	1.5	0.8	5.0
do.	R92	88.8	17.8	74.8	2.5	9.1	85.0	3.5	2.0	1.8	3.5	1.2	5.3
do.	R186	109.7	18.3	72.0	3.0	7.4	82.2	3.3	5.0	3.6	2.0	1.7	7.0
do.	R187	100.6	18.5	71.5	2.2	5.9	90.1	3.3	9.0	1.8	2.8	1.3	3.3
do.	R188	111.2	19.8	75.5	0.9	9.8	84.8	3.6	2.0	2.5	2.0	0.8	7.3
do.	38-11	114.6	18.0	74.0	1.5	16.9	75.7	4.0	5.0	2.8	1.5	1.4	7.3
do.	H51	114.0	17.4	73.2	1.1	9.0	87.4	3.8	5.0	2.0	1.5	2.9	7.3
do.	H52	112.8	18.1	77.0	2.5	9.3	84.7	4.1	12.0	---	---	2.6	5.3
U.S. 13 (check)		108.4	20.1	76.0	0.0	14.0	79.3	3.8	5.0	2.5	1.8	1.8	4.7

1/ Ia. Ill., Ind., Ohio, Nebr., Kans., Ky., Mo.
2/ Ind., Ohio
3/ Ia., Ind., Kans., Mo.
4/ Ia., Ill., Ind., Nebr., Kans., Ky., Mo.
5/ Ia., Ill., Ohio
6/ Ia., Ill., Ind., Kans., Ky., Mo.
7/ Ill.
8/ Ky.
9/ Ia., Ill., Ind., Nebr., Kans., Mo.
10/ Ia.

Table 20. Uniform double-cross hybrids. 700 Maturity series. 1958.

Hybrid	Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Smutted plants	Dropped ears	Borer Leaf feeding
	Bu. 1/	Pct. 1/	No. 2/	Pct. 3/	Pct. 4/	Pct. 5/	Score 6/	Pct. 7/	Score 8/	Score (1-9) 9/
Standards										
Ia. 4297	104.0	15.6	69.2	2.4	8.0	76.6	3.2	4.0	1.5	7.3
A.E.S. 702	107.4	17.3	70.5	0.7	6.6	83.7	3.2	1.0	0.8	5.7
A.E.S. 704	111.9	17.1	69.5	0	1.7	97.9	3.0	3.0	0.6	7.0
Nominations										
Ia. 4880	115.5	17.1	71.2	0	2.6	93.1	3.3	0	2.1	6.7
Ill.3011	114.6	17.1	69.8	0.2	5.2	91.9	3.2	2.0	1.0	4.7
Nebr. 1781e	97.7	18.2	70.2	2.7	13.4	70.0	2.9	5.0	1.5	7.0
Ia.4989	108.3	16.7	70.5	0.2	3.4	93.2	3.2	0	0.6	6.0
Ia. 4991	108.2	17.3	69.2	0.5	3.5	93.3	3.1	0	0.6	5.7
Ill. 1921	112.8	18.0	71.8	1.0	5.7	91.4	3.3	1.0	1.6	5.3
Ill. 1969	105.3	16.1	68.5	1.0	3.3	95.0	3.2	2.0	0.6	5.7
Ill.3026	103.0	18.6	69.5	2.6	4.0	89.4	3.0	2.0	0.6	4.3
Ill. 3042	116.9	18.2	69.0	0	4.9	91.2	3.2	2.0	0.4	5.9

1/ Ia., Ill., Ind., Ohio, Nebr., Kans., Mo.
2/ Ohio, Mo.
3/ Ia., Ind., Kans., Mo.
4/ Ia., Ill., Ind., Nebr., Kans., Mo.
5/ Ia., Ill., Ohio
6/ Ia., Ill., Kans., Mo.
7/ Ill.
8/ Ia., Nebr., Kans., Mo.
9/ Iowa

Table 21. Two-year performance summary of 700 maturity double cross standards and nominations.

Hybrid	Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Smutted plants	Dropped ears	Borer[1/] Leaf feeding
	Bu.	Pct.	No.	Pct.	Pct.	Pct.	Score	Pct.	Pct.	Score
Standards										
Ia. 4297	93.4	19.0	67.5	3.8	8.1	81.6	3.2	4.2	2.8	7.3
A.E.S. 702	101.9	20.8	69.8	3.0	7.6	84.9	3.2	0.5	2.6	5.7
A.E.S. 704	106.5	21.0	67.6	1.6	2.2	96.0	3.1	2.6	1.0	7.0
Nominations										
Ia. 4880	107.6	21.0	68.5	0.4	3.4	94.1	3.2	0.9	2.2	6.7
Ill. 3011	107.6	21.1	68.2	1.0	4.2	93.5	3.2	2.2	1.8	4.7

1/ 1958 data only

Hybrid pedigrees:
Ia. 4297 (WF9 x I205)(M14 x 187-2)
A. E. S. 702 (WF9 x Hy2)(M14 x C103)
A.E.S. 704 (WF9 x Oh43)(B14 x B37)
Ia. 4880 (WF9 x Oh43)(B14 x B38)
Ill. 3011 (WF9 x B14)(C103 x Oh43)

Iowa 4880 was assigned the designation A.E.S. 703
Iowa 3011 was assigned the designation A.E.S. 705

Table 22. Uniform three-way crosses. 700 maturity series. 1958.

Hybrid		Acre grain yield	Moisture at harvest	Days to ½ silk	Lodging Root	Lodging Stalk	Erect plants	Ear ht.	Dropped ears	Borer Leaf feeding
		Bu. 1/	Pct. 1/	No. 2/	Pct. 3/	Pct. 4/	Pct. 5/	Score 6/	Pct. 4/	Score 7/
(Oh28 x Oh43) x	R103	115.9	16.8	73.2	0	7.5	92.0	3.2	1.7	7.0
do.	R165	112.5	18.7	71.8	21.9	27.4	69.5	2.8	0	4.7
do	R174	110.2	20.9	68.0	3.5	12.6	85.2	3.2	1.4	4.0
do.	R185	111.6	17.0	----	0	14.7	81.0	3.5	4.2	6.3
do.	B42	113.0	18.5	70.5	6.4	9.7	89.4	3.2	0.2	4.0
do.	B43	122.7	20.0	72.0	1.5	9.4	88.5	3.2	0.4	5.3
do.	B46	119.6	17.6	73.2	2.9	6.7	92.4	3.0	0.2	5.3
do.	B49	116.8	19.1	74.0	2.5	6.6	90.8	3.2	1.3	5.7
do.	Oh7K	111.8	19.9	71.0	2.0	20.6	72.6	3.1	0.2	6.7
(WF9 x B14)	R165	117.9	17.4	71.5	16.9	14.2	76.5	3.2	0.2	6.0
do.	R174	118.6	21.3	72.2	1.5	11.6	83.5	3.4	1.9	3.3
do.	R185	114.1	17.8	72.8	1.5	10.0	80.6	3.2	3.4	7.7
do.	B42	119.6	17.4	70.8	1.5	7.9	89.2	3.3	1.4	4.7
do.	B43	113.0	19.4	71.2	0.5	8.8	85.2	3.3	1.6	6.7
do.	B46	121.2	16.5	72.2	0	3.2	96.1	3.1	0.7	7.0
do.	Oh7K	114.4	21.0	72.0	0.5	11.1	85.6	3.0	1.2	7.7
do.	R184	110.6	19.1	71.8	0.5	8.3	90.3	3.3	1.7	7.0

1/ Ia., Ill., Ind., Ohio, Nebr.
2/ Ind., Ohio
3/ Ia., Ind.
4/ Ia., Ill., Ind., Nebr.
5/ Ia., Ill., Ohio
6/ Ia., Ill., Ind.
7/ Iowa

REPORT OF THE SUB-COMMITTEE ON THE 400, 500, 600 MATURITY SERIES

Results of the 1958 tests for A.E.S. hybrids and candidates are presented in Tables 23 and 24, with two-year performance averages in Table 25. CB4621 was assigned the designation A.E.S. 514

Twenty inbreds crossed to (WF9 x M14) were tested in 1958 as three-way hybrids in seven states (Table 26). These same lines were also crossed to (W64A x Oh43) and tested as three-way hybrids in eight states (Table 27). Average performances for the 20 lines with both testers are presented in Table 29. Origin of these lines is given in the 1958 committee report. Twenty-six lines were crossed to (Oh51A x Oh26D) (Oh26A x Oh26F) and tested in three states (Table 28). Average performance for 16 lines with these three testers are presented in Table 30.

Ohio crossed the 29 inbreds listed below to the tester (Oh51A x Oh26D) (Oh26A x Oh26F) in 1958 and these "three-way" hybrids are available for testing in 1959. No other single-cross or three-way hybrid seed was produced in 1958 for these uniform groups since there were not enough nominations of new lines.

Oh45B	W375-R5	B37	MS129
Oh45C	W202	B46	MS68
H42	W64A	Pa.11	R61
H46	W153R	Pa. B8A	R168
H41	W20R	Pa.23 Carrier restorer	
H45	W22R	Pa.70	R181
W22	W32	Pa.32	
W182D	B42	MS130	

CB4621 (Minnesota) (A295 x W64A)(B14 x A239) was approved for designation as A.E.S. 514.

The following 14 hybrids will be included in the 1959 trials of A.E.S. hybrids and candidates.

Ohio M15 (Oh51 x Oh26)(A x W23)	500 maturity
AES 510 (WF9 x W22)(H19 x B9H)	500 "
Ohio K24 (Oh51A x WF9)(Oh33 x Oh40B)	600 "
AES 601 (WF9 x W22)(M14 x B14)	600 "
AES 610 (M14 x A73)(Oh43 x Oh51A)	600 "
**Ill.1960 (M14 x W64A)(B14 x A545)	500 "
**Ill. 3009 (B14 x B21)(A297 x W64A)	500 "
*Ia. 5052 (WF9 x M14)(Oh51A x W182D)	500 "
*Ia. 4967 (WF9 x M14)(Oh51A x B42)	600 "

*Ill.1969A (R165 x WF9)(R168 x B14)	600 maturity
*Ill. 3265 (R71 x R109B)(WF9 x Oh43)	600 "
*Ill. 3266 (R74 x R109B)(WF9 x Oh43)	600 "
*Ill. 3302A1 (M14 x W64A)(R172 x B14)	600 "
A.E.S. 514 (A295 x W64A)(B14 x A239)	500 "

* New nominations ** Nominated for retest

The following lines were nominated for single-cross seed production in all possible combinations:

A622 [(A298 x Amargo 41-2504B)A298]	M14 (BR10 x R8)
A427 (CC36 x A405)	WF9 (R.Y.D.)
A570 (Minn.C.B.Sgm. #2)	W64A (WF9 x Krug)
R181 [323 (2) S6]	Oh43 (W8 x Oh40B)
MS128 (Ohio M15)	MS129 (Hy2 x MS113)

The following inbreds were nominated for production of three-way hybrid seed in 1959 for uniform testing in 1960 using (WF9 x M14) and (Oh43 x W64A) as testers.

R54 [A x (4211 x 2204)] x A.41-2126-1
R158 [HP x Hy2 (F) Y]
R193 [R2 x Oh51A (2)]
R199 [N6 x Oh45 (4)]
Oh45B [Oh45 x (M14 x CI.187-2)] x Oh45
Oh45C " "
H71
Port LP-6 (20646)

E. C. Rossman, Chairman
N. P. Neal
G. H. Stringfield

Table 23. Average performance for 19 A.E.S. hybrids and candidates, 500, and 600 maturity series. 1958 summary.

Hybrid	Maturity group	Moisture %	Bu. per acre	Lodging % Stalk	Lodging % Root	Dropped ears %	Ear height Score	Ear height Inches	Smutted plants %
No. of tests		(10)	(10)	(6)	(3)	(4)	Mo.	(2)	Ohio
Ohio M15	500	21.8	90.8	15.5	13.0	0.9	3.4	55	4.2
AES 510	500	21.4	95.0	3.8	19.3	6.6	3.3	53	8.3
Ohio K24	600	22.2	91.1	8.2	14.3	2.3	2.9	50	4.2
AES 601	600	23.7	94.3	2.5	14.0	0.4	3.3	54	3.1
AES 610	600	23.5	89.6	2.2	4.7	0.3	2.5	44	1.0
Ill.1864	600	24.5	98.5	3.3	16.0	3.2	2.6	51	4.7
Ill.1960	600	22.0	93.3	5.3	11.7	0.4	2.8	53	3.1
Ind. 6225	600	22.4	97.2	6.2	6.7	0.4	3.3	54	3.1
CB4603 (Minn.)	5-600	21.5	91.4	5.2	6.7	2.8	3.1	52	5.2
CB4621 (Minn.)	5-600	20.8	96.8	6.2	4.7	0.5	3.4	52	1.0
Mich. 53-151	500	20.8	92.8	4.5	11.0	2.1	3.0	50	4.2
Ia. 4947	600	24.7	97.4	3.1	5.3	2.1	3.3	53	4.2
Ia. 5053	600	22.4	96.2	2.4	11.3	3.5	3.0	53	2.1
Ill. 3007	600	24.3	97.0	2.9	16.0	1.8	3.5	62	2.5
Ill.3009	600	21.8	98.0	5.1	6.0	1.8	3.3	56	0.0
Ill. 3043	600	25.9	95.4	2.2	5.7	1.9	3.1	56	1.0
Ill. 3152	600	24.5	103.3	3.7	8.7	1.2	3.0	52	0.0
CB4617 (Minn.)	500	22.1	96.4	3.1	7.3	0.0	3.0	52	2.1
Minn. 201	500	22.7	95.6	2.5	9.0	0.7	2.9	51	1.0

Hybrid	Corn borer rating 1/	Shelling	Test weight lbs.	Days to silk	Plants with ears %	Husk cover score 2/
	Iowa	Ill.	Ohio	Ohio	Ohio	Ohio
Ohio M15	6.7	81	57.6	80.8	92.6	2.8
AES 510	6.7	76	55.5	80.2	89.4	3.4
Ohio K24	4.7	79	56.6	79.8	92.6	2.8
AES 601	7.0	77	56.9	81.8	87.4	2.8
AES 610	--	79	57.6	79.2	87.4	2.3
Ill. 1864	6.3	77	56.5	81.3	98.3	2.8
Ill. 1960	7.0	80	59.4	80.5	98.8	2.8
Ind. 6225	8.3	80	57.8	80.3	90.5	2.6
CB4603 (Minn.)	7.0	79	57.3	79.3	89.4	2.6
CB4621 (Minn.)	6.7	78	58.4	79.8	92.6	2.8
Mich. 53-151	7.7	78	56.3	79.3	92.6	2.4
Ia. 4947	7.7	77	57.0	80.7	96.7	2.6
Ia. 5053	7.3	77	57.2	80.7	92.6	2.8
Ill. 3007	6.7	80	55.9	83.4	93.8	3.2
Ill. 3009	7.3	79	57.0	80.4	93.8	2.7
Ill. 3043	5.0	79	55.8	82.2	100.9	3.0
Ill. 3152	6.7	79	56.3	80.2	95.0	2.6
CB4617 (Minn.)	---	78	58.1	80.0	93.6	3.0
Minn. 201	---	79	56.4	81.0	88.4	2.7

1/ Rated 1 to 9 2/ Rated - 1 (shortest) to 5 (Longest)
Average plant population = 13,900 plants per acre

Table 23. (cont'd.)

State	Moisture	Yield	Stalk lodging	Root lodging	Ear height inches	Dropped ears
Minnesota	X	X	X			X
South Dakota	X	X				
Iowa	X	X	X			X
Missouri	X	X	X			X
Nebraska	X	X	X	X		X
Wisconsin	X	X				
Illinois	X	X		X	X	
Ohio	X	X	X		X	
Indiana	X	X	X	X		
Michigan	X	X				

Stalk lodging in Michigan test and root lodging in Iowa, Missouri, Ohio, and Michigan tests were almost nil so they were omitted from averages.

PEDIGREES:

Ohio M15	(Oh51 x Oh26)(A x W23)	Mich.53-151	(WF9 x MS209)(MS106 x MS107)
AES 510	(WF9 x W22)(E1? x B9H)	Ia.4947	(WF9 x M14)(Oh51A x A257)
Ohio K24	(Oh51A x WF9)(Oh33 x Oh40B)	Ia.5053	(WF9 x M14)(A257 x W182D)
AES 601	(WF9 x W22)(M14 x B14)	Ill.3007	(R61 x WF9)(R169 x B14)
AES 610	(M14 x A73)(Oh43 x Oh51A)	Ill.3009	(B14 x B21)(A297 x W64A)
Ill.1864	(M14 x WF9)(Oh43 x W22)	Ill. 3043	(R71 x R109B)(WF9 x B14)
Ill.1960	(M14 x W64A)(B14 x A545)	Ill. 3152	(M14 x WF9)(B14 x Oh43)
Ind. 6225	(W64A x M14)(B14 x A297)*	CB4617	(B14 x A239)(M14 x W64A)***
CB4603	(A295 x W64A)(B14 x A297)**	Minn.201	(WF9 x Oh51A)(B14 x M14)
CB4621	(A295 x W64A)(B14 x A239)	Minn.201	(WF9 x Oh51A)(B14 x M14)

*Same pedigree as Ill. 1959, ** Same pedigree as Ill. 3002,
*** entered as Minn. 200.

Table 24. Average performance by states for 19 AES hybrids and candidates, 500 and 600 maturity groups. 1958.

Hybrid	Minn.	S. D.	Iowa	Mo.	Nebr.	Wis.	Ill.	Ohio	Ind.	Mich.
				BUSHELS PER ACRE						
Ohio M15	101.3	52.0	86.7	78.1	110.6	107.2	119	101.5	67	84.2
AES 510	105.9	----	94.3	88.5	101.2	124.4	116	102.5	74	85.8
Ohio K24	99.7	61.1	87.8	90.7	91.4	118.8	113	102.5	67	79.2
AES 601	99.4	----	78.8	92.2	91.2	124.9	137	100.6	70	89.9
AES 610	102.1	58.2	----	77.5	90.0	120.3	120	96.7	68	73.1
Ill. 1864	111.3	49.6	97.9	87.3	115.6	127.7	126	111.8	64	94.1
Ill. 1960	113.2	53.9	100.8	81.0	84.3	120.5	118	106.6	64	90.5
Ind. 6225	108.4	63.1	97.8	93.0	90.4	124.0	127	98.5	72	97.3
CB4603 (Minn.)	103.7	60.1	103.6	87.3	85.2	110.4	117	92.4	64	89.8
CB4621 (Minn.)	111.4	66.6	99.5	83.3	97.2	126.7	119	105.1	77	81.7
Mich. 53-151	-----	54.0	93.4	86.8	97.8	121.2	105	107.5	72	85.9
Ia. 4947	103.9	52.4	100.3	92.7	106.4	132.2	118	106.9	72	89.5
Ia. 5053	110.4	64.5	97.9	88.0	93.4	113.3	122	100.3	77	94.7
Ill. 3007	110.5	53.0	95.8	95.6	89.7	135.7	135	105.5	63	85.9
Ill. 3009	114.7	56.8	106.9	92.8	100.4	121.4	123	106.8	77	80.6
Ill. 3043	97.0	55.7	98.3	98.8	90.2	127.4	118	105.4	73	89.8
Ill. 3152	106.7	58.4	106.6	94.0	105.8	128.4	140	113.3	87	92.6
CB4617 (Minn.)	113.1	56.0	-----	86.1	93.2	116.6	126	108.1	72	94.2
Minn. 201	107.3	60.5	-----	88.0	89.6	130.2	124	101.2	70	88.7

Table 24. (cont'd.)

Hybrid	Minn.	S. D.	Iowa	Mo.	Nebr.	Wis.	Ill.	Ohio	Ind.	Mich.
					MOISTURE %					
Ohio M15	25.0	11.9	16.7	12.6	14.8	24.7	25	32.9	22.6	31.9
AES 501	24.9	----	15.0	12.8	12.7	24.7	28	30.6	23.1	30.9
Ohio K24	25.1	11.1	18.5	13.0	14.0	23.9	28	31.1	24.3	33.1
AES 601	27.3	----	19.7	13.2	14.6	28.4	30	32.6	24.1	24.3
AES 610	29.4	12.1	----	13.4	15.8	25.7	29	33.4	24.6	33.4
Ill. 1864	29.6	13.8	18.6	14.2	15.0	27.9	32	33.6	25.3	35.1
Ill. 1960	24.2	11.9	17.6	13.0	13.4	25.4	30	29.7	23.3	31.4
Ind. 6225	26.4	11.6	19.4	13.1	15.2	24.4	28	31.0	22.8	32.0
CB4602 (Minn.)	23.9	12.2	16.4	13.1	13.9	26.8	27	29.4	21.3	31.3
CB4621 (Minn.)	24.8	11.5	16.8	12.8	13.6	22.3	27	27.7	21.2	30.5
Mich. 53-151	----	10.8	17.2	11.6	13.2	21.8	26	29.7	23.2	30.8
Ia. 4947	29.0	12.1	20.6	13.6	16.0	27.7	32	36.1	25.9	34.1
Ia. 5053	25.4	11.2	16.8	13.4	13.8	27.3	29	31.5	23.9	31.7
Ill. 3007	27.1	13.3	20.0	13.9	14.4	28.7	32	34.5	23.9	35.0
Ill. 3009	24.0	11.7	16.0	13.4	14.2	25.9	28	28.0	21.7	34.7
Ill. 3043	29.7	15.9	19.7	13.7	17.8	29.6	36	26.0	25.3	35.2
Ill. 3152	29.3	12.8	19.3	13.2	15.8	29.2	32	32.8	25.1	35.8
CB4617 (Minn.)	25.1	11.5	-----	13.9	13.7	27.5	28	30.3	22.4	31.7
Minn. 201	27.3	12.2	----	13.0	13.3	25.4	30	30.8	24.2	32.9

Table 25. Two-year average performance for 11 AES hybrids and candidates, 500 and 600 maturity groups. Summary. 1957 and 1958.

Hybrid	Moisture %	Bu. per acre	Lodging % Stalk	Lodging % Root	Dropped ears %	Smut %	Days to silk	Corn borer rating 1/
No. of tests	18	18	12	8	5	3	2	2
Ohio M15	22.9	88.9	15.9	18.2	0.9	2.3	76	7.4
AES 510	23.2	96.2	4.3	7.9	5.9	4.8	76	7.1
Ohio K24	23.7	92.2	7.2	6.7	2.0	5.0	76	5.2
AES 601	25.4	98.3	2.9	5.6	0.3	1.0	77	7.3
AES 610	24.4	90.3	4.1	2.1	0.2	1.5	75	6.3
Ill. 1864	25.9	100.7	3.3	6.6	3.1	3.0	77	6.0
Ill. 1960	24.0	97.3	4.1	4.5	0.5	1.9	77	6.5
Ind. 6225	23.8	100.8	5.0	2.8	0.3	3.6	76	8.0
CB4603 (Minn.)	23.1	94.7	3.7	2.7	2.4	3.9	75	7.5
CB4621 (Minn.)	22.3	98.1	4.3	2.0	0.6	1.3	76	6.7
Mich. 53-151	22.2	94.4	4.6	4.9	2.4	5.3	76	7.4

Hybrid	Shelling %	Ear height Score	Ear height Inches	Husk cover score 2/	Leaf blight score 3/	Aphids %	Bird injured plants %	Plants with ears %
No. of tests	2	2	3	2	Ohio	Ohio	Ohio	Ohio
Ohio M15	78.5	4.1	52	2.9	1.8	4.2	2.5	92.6
AES 510	76.5	3.7	49	3.7	3.3	0.0	1.7	89.4
Ohio K24	77.5	3.5	46	2.7	2.5	0.8	8.3	92.6
AES 601	77.0	3.8	50	3.3	3.0	2.7	0.0	87.4
Ill. 1864	77.0	3.3	47	3.2	2.5	3.4	6.8	98.3
AES 610	78.5	3.0	42	2.6	1.5	0.8	10.7	87.4
Ill. 1960	79.0	3.6	50	2.9	3.3	4.2	3.3	98.8
Ind. 6225	79.0	3.8	51	2.8	3.8	3.7	6.8	90.5
CB4603 (Minn.)	78.0	3.6	49	2.7	4.3	2.5	0.8	89.4
CB4621 (Minn.)	77.5	3.9	48	2.9	4.0	1.7	8.4	92.6
Mich. 53-151	77.5	3.5	48	2.6	3.0	0.8	9.2	92.6

1/Rated-- 1 = resistant, 9= susceptibls; 2/Rated - 1 = shortest, 5 = longest;
3/Rated - 1 = least, 5 = most.

	Minn.	S.D.	Iowa	Mo.	Nebr.	Wis.	Ill.	Ohio	Ind.	Mich.
Moisture %	78	78	78	8	78	78	78	78	8	78
Bushels per acre	78	78	78	8	78	78	78	78	8	78
Stalk lodging %	78		78	8	78		7	78	8	7
Root lodging %	7		7		78		8	7	8	7
Dropped ears %	8		78	8	8					
Smut %							7	78		
Days to silk								78		
Corn borer rating			78							
Shelling %							78			
Ear height - score				8				7		
Ear height - inches							78	8		
Husk cover score								8		
Leaf blight score								7		
Aphids %								7		
Bird injured plants %								7		
Plants with ears %								8		

7 = 1957 data 8 = 1958 data

Table 26. Average performance for 20 inbreds in 3-way hybrids with WF9 x M14 as tester grown at 7 locations. Uniform 500, 600, maturity groups. 1958.

Pedigree	Bu. per acre	Moist-ure %	Lodging % stalk	Lodging % root	Dropped ears %	Ear height inches	Smut %	Corn borer rating *	Shelling %
	7	7	4	3	2	2	Minn.	Iowa	Ill.
(WF9 x M14) x Ia.55-1473	100.6	23.5	7.4	22.2	0.7	37	1.4	6.0	77
" Ia.55-1487	96.0	25.6	1.8	1.5	1.7	34	0	5.7	77
" Ia.55-1716	103.0	27.1	2.6	5.5	1.1	41	0	6.0	74
" Oh26F	91.5	23.9	1.8	7.8	0.8	34	5.8	7.7	78
" Oh45s	100.3	29.0	2.0	13.9	0.4	37	0	5.7	74
" W212	99.6	25.8	5.0	13.5	10.1	38	1.2	8.3	77
" W220	105.2	24.1	1.4	9.9	7.9	34	3.0	7.7	77
" W375R5	98.4	23.7	2.3	12.7	5.0	35	0	7.0	79
" A427	101.6	26.1	1.3	2.0	1.7	36	1.4	6.0	78
" A570	106.0	23.4	5.0	9.3	2.2	36	0	4.3	76
" R151	108.1	25.3	7.8	8.3	2.0	42	0	7.7	79
" R180	89.2	26.8	3.8	9.4	5.9	42	1.3	8.7	78
" R181	109.7	21.7	4.6	16.5	2.6	39	4.0	6.0	77
" R182	95.9	25.0	1.8	5.6	6.0	40	2.6	7.7	77
" R183	92.8	26.2	3.7	10.0	0	43	4.1	7.3	78
" MS68	84.0	23.1	6.4	18.9	1.5	32	1.4	8.7	76
" MS116	111.6	18.7	4.3	8.5	7.3	37	4.2	4.3	84
" MS127	96.8	24.2	7.8	5.5	0.3	40	3.0	7.3	78
" MS128	93.3	23.6	8.2	4.0	2.9	38	3.8	6.7	79
" MS129	105.0	26.3	4.9	17.6	0.7	36	2.6	8.0	79
(WF9 x M14) tester	104.0	23.9	1.6	21.0	0.5	37	3.4	8.0	76

* Rated 1 -- 9
Average plant population = 14,000 plants per acre

	Minn.	S. D.	Iowa	Wis.	Ind.	Ill.	Mich.
Yield	X	X	X	X	X	X	X
Moisture %	X	X	X	X	X	X	X
Stalk lodging %	X		X		X		X
Root lodging %			X		X	X	X
Dropped ears %	X		X				
Ear Height - inches					x	x	
Smut %	X						
Corn borer rating			X				
Shelling %						X	

Table 27. Average performance for 20 inbreds in 3-way hybrids with (W64A x Oh43) as a tester grown at eight locations. Uniform 500, 600 maturity groups. 1958

(W64A x Oh43) X Inbred	Yield	% Moisture	Lodging % stalk	Lodging % root	Drop. ears %	Ear ht. in.	Smut %	Corn borer rating	Shell %	Days to silk	Plants with ears %	Husk cover score	Test weight
No. of tests	8	8	6	3	3	3	2	Iowa	Ill.	Ohio	Ohio	Ohio	Ohio
Ia.55-1473	94.7	23.6	13.0	18.9	0.3	39	1.3	6.0	77	78	86	3.1	56.6
Ia.55-1487	88.3	26.0	3.4	0.7	0.6	39	1.9	5.3	78	80	87	2.9	56.9
Ia.55-1716	94.1	25.7	2.3	1.0	0.8	42	2.5	2.7	77	83	84	2.4	58.4
Oh26F	79.7	29.2	1.8	4.3	0.0	35	1.3	4.3	76	82	79	3.1	57.7
Oh45S	93.5	23.9	1.9	5.3	1.4	40	2.5	7.0	78	81	87	2.9	57.3
W212	102.0	24.8	4.8	3.0	3.5	40	2.3	8.0	76	78	85	2.5	59.7
W220	96.7	24.6	4.4	2.5	4.1	39	4.0	6.7	78	76	87	2.4	56.0
W375R5	95.1	23.9	5.2	3.0	1.7	38	4.1	6.0	79	78	84	2.7	57.4
A427	94.8	24.6	3.2	1.0	1.1	40	1.8	6.3	77	81	85	2.9	57.7
A570	99.6	25.6	1.7	8.7	1.5	43	2.9	5.0	77	79	90	2.6	57.1
R151	105.2	26.6	5.0	4.0	2.0	46	1.7	7.7	79	79	90	2.8	57.4
R180	96.2	27.7	2.2	4.7	4.9	43	2.6	8.7	85	82	92	3.0	57.0
R181	103.5	23.1	9.0	5.0	1.8	43	3.7	5.0	76	79	88	2.7	55.0
R182	95.2	24.0	0.9	1.7	1.6	43	2.0	6.7	78	80	87	2.4	58.7
R183	90.3	27.5	1.5	12.8	0.3	51	1.8	6.7	79	83	85	3.0	61.4
MS68	86.4	23.7	5.5	10.7	0.3	38	3.5	6.3	79	76	82	2.5	56.7
MS116	104.1	21.3	6.5	9.3	2.8	42	13.2	5.7	81	77	92	2.7	57.9
MS127	92.5	24.3	11.4	3.3	0.3	41	6.7	7.0	80	78	81	2.3	56.3
MS128	92.2	24.8	5.1	3.0	3.6	44	1.0	5.3	79	82	84	2.7	57.0
MS129	106.3	26.1	4.4	6.7	0.9	45	0.6	5.3	76	81	86	2.7	59.2
(W64A x Oh43)	100.2	26.0	2.4	7.5	0.0	37	1.9	6.0	77	77	88	2.8	59.2

Corn borer ratings - 1 to 9
Husk cover score - 1 = shortest, 5 = longest
Average plant population = 13,700 plants per acre

Table 27. (cont'd.)

	Minn.	Nebr.	S. D.	Iowa	Ind.	Ill.	Ohio	Mich.
Yield	X	X	X	X	X	X	X	X
Moisture %	X	X	X	X	X	X	X	X
Stalk lodging %	X	X		X	X		X	X
Root lodging %				X	X	X		
Dropped ears %	X	X		X				
Ear height inches					X	X	X	
Smut %	X						X	
Corn borer rating				X				
Shelling %						X		
Days to silk							X	
Plants with ears %							X	
Husk cover score							X	
Test weight							X	

Table 28. Average performance for 26 inbreds in 3-way hybrids with (Oh51A x Oh26D)(Oh26A x Oh26F) as tester grown at three locations. Uniform 500, 600 maturity groups. 1958.

Tester x Inbred	Yield	Moisture %	Lodging % Stalk	Lodging % Root	Ear ht. ins.	Days to silk	Shelling %	Ears per 100 plants	Husk cover score	Plant ht. ins.
No. of tests	3	3	3	2	2	2	Ind.	Ohio	Ohio	Ind.
Oh3267	98.8	27.8	3.1	3.0	41	71	82	86	2.8	92
Ia.55-1487	96.8	32.9	1.7	0.5	41	72	85	91	3.0	96
Oh3557	96.7	30.5	4.7	0.5	43	72	83	84	2.2	95
Oh56A	82.2	30.6	15.4	3.7	40	72	87	90	2.5	88
Oh3560	107.9	34.0	5.3	1.0	45	73	82	98	2.4	96
W212	102.3	32.3	6.6	4.1	44	71	81	91	2.4	97
W220	99.8	31.7	2.9	2.0	43	69	81	88	2.4	92
W375R5	91.8	31.7	4.5	3.3	44	70	76	99	2.6	97
A427	94.0	31.2	2.7	0.0	47	74	84	89	3.0	102
A570	103.9	31.2	1.3	4.8	44	72	80	96	2.7	98
R151	111.3	28.6	3.4	1.5	49	72	82	108	2.9	99
R180	98.8	35.4	4.0	2.5	48	74	86	90	3.0	100
R181	111.7	28.3	5.5	4.5	45	75	82	99	2.8	98
R182	91.7	32.3	2.7	3.1	44	73	83	88	2.4	101
R183	101.8	28.1	3.3	0.0	53	75	82	94	3.6	106
MS68	89.5	31.4	7.7	1.5	39	68	83	84	2.7	83
MS116	100.5	26.7	4.8	1.5	41	69	84	84	2.8	95
MS127	93.4	31.4	6.6	3.2	44	71	84	93	2.4	89
MS128	89.0	31.8	6.4	1.0	41	74	84	92	2.8	95
MS129	112.7	29.5	2.0	0.5	45	74	82	94	3.1	100
CI.28A	105.7	32.2	6.1	1.0	52	77	78	80	2.7	108
Minn.Syn.1	107.1	31.4	6.2	3.1	47	72	83	97	2.8	100
A392 x R61	106.5	30.1	1.9	4.7	46	71	84	100	2.2	96
Oh24 Syn 1A	98.7	32.3	2.4	0.0	43	74	81	94	3.0	100
Oh24 Syn 1B	94.5	34.1	1.7	2.3	49	75	80	84	3.3	107
W24 x B2	102.2	33.6	1.4	7.0	51	73	81	94	2.9	110

Husk cover score rated - 1= shortest, 5 = longest
Average plant population = 13,100 plants per acre

	Ind.	Ohio	Mich.
Yield	X	X	X
Moisture %	X	X	X
Stalk lodging %	X	X	X
Root lodging %	X	X	
Ear height - inches	X	X	
Days to silk	X	X	
Shelling %	X		
Ears per 100 plants		X	
Husk cover score		X	
Plant height inches		X	

Table 29. Average performance for 20 inbreds in 3-way hybrids with (WF9 x M14) and (W64A x Oh43) as testers. 1958.

Testers X Inbreds	Yield	Moisture %	Lodging % Stalk	Lodging % Root	Drop ears %	Ear ht. inches	Smut %	Corn borer rating	Shelling %
Ia.55-1473	97.7	23.6	10.7	20.6	0.5	38	1.4	6.0	77
Ia.55-1487	92.2	25.8	2.6	1.1	1.2	37	1.0	5.5	78
Ia.55-1716	98.6	26.4	2.5	3.3	1.0	42	1.3	4.4	76
Oh26F	85.6	26.6	1.8	6.1	0.4	35	3.6	6.0	77
Oh45S	96.9	26.5	2.0	9.6	0.9	39	1.3	6.4	76
W212	100.8	25.3	4.9	9.3	6.8	39	1.8	8.2	77
W220	101.0	24.4	2.9	7.2	6.0	37	3.5	7.2	78
W375R5	96.8	23.8	3.8	7.9	3.4	37	2.1	6.5	79
A427	98.2	25.4	2.3	1.5	1.4	38	1.6	6.2	78
A570	102.8	24.5	3.4	9.0	1.9	40	1.5	4.7	77
R151	106.7	26.0	6.4	6.2	2.0	44	0.9	7.7	79
R180	92.7	27.3	3.0	7.1	5.4	43	2.0	8.7	82
R181	106.6	22.4	6.8	10.8	2.2	41	3.9	5.5	77
R182	95.6	24.5	1.4	3.7	3.8	42	2.3	7.2	78
R183	91.6	26.9	2.6	11.4	0.2	47	3.0	7.0	79
MS68	85.2	23.4	6.0	14.8	0.9	35	2.5	7.5	78
MS116	107.9	20.0	5.9	8.9	5.1	40	8.7	5.0	83
MS127	94.7	24.3	9.6	4.4	0.3	41	4.8	7.2	79
MS128	92.8	24.4	6.7	3.5	3.8	41	2.4	6.0	79
MS129	105.7	26.2	4.7	12.2	0.8	41	1.6	6.7	78
Average for 2 testers	102.1	25.0	2.0	14.3	0.3	37	2.7	7.0	77

Table 30. Average performance for 16 inbreds in 3-way hybrids with (WF9 x M14), (W64A x Oh43), and (Oh51A x Oh26D) (Oh26A x Oh26F) as testers. 1958.

Testers X Inbred	Yield	Moisture %	Lodging % Stalk	Lodging % Root	Ear height inches	Shelling %
Ia.55-1487	93.7	28.2	2.3	0.9	38	80
W212	101.3	27.6	5.5	6.9	41	78
W220	100.6	26.8	2.9	4.8	39	79
W375R5	95.1	26.4	4.0	6.3	39	78
A427	96.8	27.3	2.4	1.0	41	80
A570	103.2	26.7	2.7	7.6	41	78
R151	108.2	26.8	5.4	4.6	46	80
R180	94.7	30.0	3.3	5.5	44	83
R181	108.3	24.4	6.4	8.7	42	78
R182	94.3	27.1	1.8	3.5	42	79
R183	94.7	27.3	2.8	7.6	49	80
MS68	86.6	26.1	6.5	10.0	36	79
MS116	105.4	22.2	5.2	6.4	40	83
MS127	94.2	26.6	8.6	4.0	42	81
MS128	91.5	26.7	6.6	2.7	41	81
MS129	108.0	27.3	3.8	8.3	44	79

REPORT OF THE SUB-COMMITTEE ON THE 100, 200, 300 MATURITY SERIES

The performance of 13 double crosses tested at six locations in 1958 is presented in tables 31, 32 and 33. The hybrid M148 (W33 x A509)(ND203 x A508) was given the designation AES204.

Table 31. Summarized performance of 100, 200, and 300 maturity series. AES hybrid candidates - 1958.

Pedigree	Hybrid No.	Acre yield bu.1/	Moisture %1/	Days to silk no. 2/	Lodging Root %3/	Lodging Stalk %4/	Corn borer score5/	Shelling %6/
W33xA508:ND203xA509	M147	61.9	30.4	59	1.0	5.6	4.0	79.1
W33xA509:ND203xA508	M148	61.3	31.4	60	2.5	8.7	4.5	79.7
CM3xW103:W59MxW41A	W1640	51.8	30.9	62	2.0	10.4	2.5	83.3
W33xND203:A508xA513	M151	58.6	32.2	61	1.0	9.7	5.0	80.0
ND230xND203:A90xMS1334	ND307	61.7	32.1	62	1.5	15.2*	3.0	78.9
CMD5xW59M:A509xMS1334	AES202	64.6	32.5	64	2.0	11.3*	2.5	78.9
CMD5xA509:W59MxMS1334	AES203	62.9	34.2	64	2.0	7.4	1.5	79.4
W59MxW117:W183B	W273	59.5	35.5	65	1.0	3.9	4.0	81.4
CM3xND203:B8xA90	ND7-58	61.1	36.5	65	0.5	4.6	3.0	80.4
A498xMS1334:B8xA90	ND8-58	64.2	36.6	65	1.5	6.1	2.0	81.5
W9xWM13:W25xIo.153	W355	59.0	43.4	66	2.0	3.4	4.0	79.8
B8xMS211: MS114xMS116	MS54-27	67.2	44.1	69	2.5	8.8	4.0	81.9
MS116xMS211:W10xMS206	MS53-4544	66.4	43.3	70	3.0	4.9	4.5	81.2

Table 32. Yield and moisture in each of six stations, and per-cent of Nodakhybrid 307 in five stations.

Hybrid No.	Yield per acre by stations N.D.	Mich.	Wis.	Ont.	S.D.	Min.	% of1/ ND307	Moisture % by stations N.D.	Mich.	Wis.	Ont.	S.D.	Min.	% of1/ ND307
M147	53.0	55	81.2	77.9	42.4	68	100	25.6	36	36.3	32.9	21.1	42.5	95
M148	58.9	56	81.7	74.0	35.9	71	99	27.9	36	36.3	32.7	24.2	41.4	93
W1640	48.3	54	71.4	67.3	18.2	---	84	27.4	37	37.6	36.5	16.0	---	96
M151	49.9	54	76.2	72.9	40.0	70	95	29.3	37	38.2	34.8	21.7	40.2	100
ND307	62.2	55	79.9	78.4	33.2	71	100	28.8	36	37.2	34.4	23.9	41.6	100
AES202	59.3	57	81.5	85.5	39.9	69	105	28.1	38	41.6	36.0	19.0	43.2	102
AES203	56.4	54	83.5	84.8	35.6	71	102	29.8	39	40.8	35.4	25.2	43.1	106
W273	52.7	62	76.5	78.0	28.4	70	96	29.9	39	45.4	40.7	22.6	45.0	111
ND7-58	57.9	48	76.7	85.5	37.3	---	99	33.1	40	42.4	35.9	31.1	---	114
ND8-58	55.8	60	78.6	84.4	42.3	---	104	33.9	40	43.8	38.6	26.0	---	114
W355	54.1	58	74.9	78.2	29.7	---	96	39.2	44	50.1	43.8	40.0	---	135
MS54-27	60.3	64	83.2	91.9	36.4	---	109	39.7	44	50.8	45.5	40.5	---	138
MS53-4544	58.9	64	83.7	88.9	36.5	---	108	41.5	44	49.8	43.7	37.4	---	135
L.S.D.	5.3	---	---	10.2	10.8	84	---	3.6	---	---	2.4	---	2.3	---

Table 33. Miscellaneous data.

Hybrid No.	Rating-score Plants ND	Plants Min	Ears ND	Ears Min	Height-inches Plants ND	Plants Min	Ears ND	Ears Min	Good Ears Min
M147	2.8	2.1	3.3	3.3	79	82	27	36	45
M148	2.6	2.3	2.9	2.8	78	79	28	34	66
W1640	3.4	---	4.5	---	78	---	24	---	---
M151	3.2	2.6	3.2	2.8	80	84	28	36	68
ND307	1.5	2.5	1.4	2.8	83	82	29	35	76
AES202	2.3	2.5	2.3	3.0	81	84	27	36	67
AES203	2.3	2.8	2.4	2.8	82	85	27	33	83
W273	2.5	2.5	3.1	3.5	84	85	32	37	64
ND7-58	2.0	---	2.5	---	82	---	30	---	---
ND8-58	2.0	---	2.4	---	84	---	32	---	---
W355	1.5	---	3.2	---	86	---	36	---	---
MS54-27	1.0	---	1.2	---	90	---	40	---	---
MS54-4544	1.0	---	2.2	---	92	---	42	---	---

1/ Average of yield: N.Dak., Mich. Wis., Ont., S. Dak.
2/ Days to silk: Fargo, N. Dak.
3/ Root lodging: N. Dak., Mich.
4/ Stalk lodging: N. Dak., Mich. Ont.
5/ Corn borer leaf feeding score: Wooster, Ohio
6/ Shelling %: N. Dak., Wis., Ont.
* Stalk lodging high in Ontario

Candidates for 1959 Testing

Standards

AES 202 (CMD5 x W59M)(A509 x MS1334)
ND 307 (ND230 x ND203)(A90 x MS1334)
AES 204 (W33 x A509)(ND203 x A508)

New nominations

M156 (B8 x ND203)(A498 x MS1334)
M157 (A90 x A498)(ND203 x MS1334)
W1684 (W491 x W525)(W375A x W182B)

The Committee plans to produce 3-way hybrid seed for 1960 testing.

Wm. Wiidakas, Chairman
E. H. Rinke
A. M. Strommen
E. C. Rossman

Table 34. Regional tests for 1959 and the states requesting seed.

	900 Series			800		700		500-600		200-300
	Doubles	Yel. 3 ways	Wh. 3 ways	Doubles	3 ways	Doubles	3 ways	Doubles	3 ways	Doubles
Illinois	X	X	X	X	X	X	X	X		
Iowa	X	X	X	X	X	X	X	X		
Indiana				X	X	X	X	X	X	
Kansas	X	X	X	X	X	X				
Kentucky	X	X	X	X	X					
Michigan								X	X	X
Minnesota								X	X	X
Missouri	X	X	X	X	X	X				
Nebraska			X	X	X	X	X	X	X	
Ohio				X	X	X	X	X	X	
Oklahoma				X	X					
North Dakota										X
South Dakota									X	X
Wisconsin										X
Virginia	X		X	X	X	X	X			

It was MOVED by N. P. Neal and seconded by E. H. Rinke that the location of the next meeting be left to the descretion of the Executive Committee.

Motion failed.

It was MOVED by E. H. Rinke and seconded by F. A. Loeffel that the North Central Corn Breeding Research Committee hold its next meeting in Chicago in 1959.

Motion passed.

It was MOVED by E. H. Rinke and seconded by P. Crane that the meeting be held the first week in March. Approved. The dates of March 2 and 3 were selected.

It was MOVED by P. Crane and seconded by D. B. Shank that a Committee be appointed to look into the possibility of a new location for the meetings in future years.

Motion passed.

Meeting adjourned

Committees for 1959-60

Preservation of Germ Plasm - J.H.Lonnquist, J. Dollinger and D.B.Shank (Chairman)
Grouping of Lines for Breeding Purposes - N. P, Neal, A. M. Brunson and W. A. Russell (Chairman)
Cytoplasmic Male Sterility and Restorers - J. H. Lonnquist, W. A. Russell and J. B. Beckett (Chairman)
Maturity Studies - E. Leng, Wm. Widakas, E. H. Rinke, E. C. Rossman and N. P. Neal (Chairman)
Cooperative Winter Nurseries - L.F.Bauman, E. Leng, M.S.Zuber, E.C.Rossman(Chairman)
Meeting Place - D.B.Shank, M.S.Zuber and P. Crane (Chairman)
Uniform Tests in the 900 Maturity Series - Wm. R.Findley, F.A. Loeffel and C.O. Grogan (Chairman)
Uniform Tests in the 700-800 Maturity Series - R.W.Jugenheimer, J.H.Lonnquist, and L. H. Penny (Chairman)
Uniform Tests in the 400-500-600 Maturity Series - N.P.Neal, E.C. Rossman and L.F. Bauman (Chairman)
Uniform Tests in the 100-200-300 Maturity Series - E. H. Rinke, A. M. Strommen and Wm. Widakas (Chairman)